AMERICAN DYESTUFF REPORTER

"Circulated Everywhere Dyestuffs Are Used"

Devoted to the Practical Application of Dyestuffs and the Mechanical Equipment Incidental Thereto

VOL. X · NEW YORK, JANUARY 30, 1922 · Number 3

The Control of Dyestuff Stocks

An Article Showing How One Laboratory Made an Easy Routine of This Work, Presented for Publication by the Chemist of a Large Textile Plant Who Prefers that His Name Be Withheld

IN the small mill or dyehouse the chemist usually is charged with the ordering of dyestuffs and chemicals. Unless a systematic record is kept, the chemist finds either that a supply of *dead* materials has collected—i. e., dyestuffs and chemicals no longer in use—or that there is an occasional shortage of some particular color or chemical.

In the present unsettled stage of the dyestuff and chemical markets it is exceedingly unwise to carry large stocks. Prices are constantly changing. While in many instances heavy chemicals compare rather favorably with pre-war prices, it is unwise to carry extra large stocks or to contract without a price protection clause. Not only are new and better dyestuffs continually coming on the market, but competition also is steadily forcing prices down.

A mill should carry small stocks, and these should be turned over rapidly. Some items in the way of chemicals and dyestuffs are needed but a few times each year. A small stock of these should be carried. Large items which are staples and in constant use should be carried in sufficient quantities to insure against shortage. With good railroad connections, we have found that one month's supply ahead is sufficient.

A Practical Control Method

To insure a sufficient supply and to prevent the accumulation of dead materials, the following method of control has been worked out:

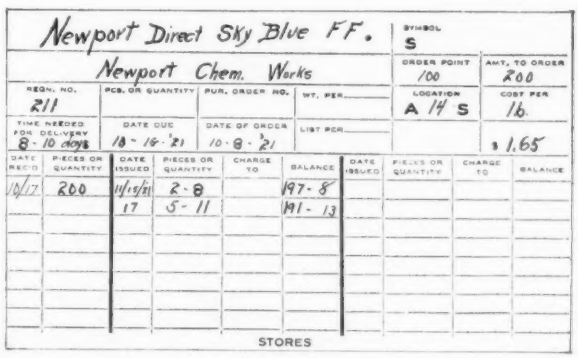
When an invoice of goods to be dyed is received, the invoice is sent to the laboratory. There the customer's name and lot number are entered on a 3 x 5 card, with the number of yards, weight of goods and shade. The original invoice is initialed and sent on. Should this invoice call for any special dyestuff or chemical, the fact is noted. On checking our balance cards, should we find an insufficient amount of dyestuffs or chemicals on hand, or should we find that our supply will be exhausted when the lot is finished, a new supply is ordered at once. Should the color be a shade which we dye regularly, no special note is made. When the goods are dyed, the facts noted are crossed out on the cards. In this way the laboratory knows at all times the amount of work ahead of the dyehouse and can estimate the color required to complete the work.

Dyestuffs and chemicals in constant use are carried in quantities large enough to take care of one month's work. Fig. 1 shows a sample balance card. As will be seen, the essential facts as to manufacturer, price, order point, amount to order and a perpetual balance are always carried.

These cards are filed by colors (blacks, blues, browns, etc.) and alphabetically for chemicals. Each morning the laboratory receives a list of the amount of chemicals and dyestuffs used the previous day in the dyehouse. In the dyehouse all dyestuffs and chemicals are handled from one drug room and the man in charge enters all items on the sheet shown in Fig. 2.

System Requires but a Few Minutes Each Day

It takes but a few minutes each day to check off the items on the balance cards in the laboratory. When an item is approaching or has reached the order point, more material is ordered at once.


Newport Direct Sky Blue FF.

SYMBOL: S

Newport Chem. Works

ORDER POINT: 100 · AMT. TO ORDER: 200

REQN. NO.: 211 · PCS. OR QUANTITY · PUR. ORDER NO. · WT. PER · LOCATION: A 14 S · COST PER: lb.

TIME NEEDED FOR DELIVERY: 8-10 days · DATE DUE: 18-16-'21 · DATE OF ORDER: 10-8-'21 · LIST PER · $ 1.65

DATE RECD	PIECES OR QUANTITY	DATE ISSUED	PIECES OR QUANTITY	CHARGE TO	BALANCE	DATE ISSUED	PIECES OR QUANTITY	CHARGE TO	BALANCE
10/27	200	11/15/21	2-8		197-8				
		17	5-11		191-13				

STORES

FIG. 1—*Sample Balance Card*

AM64

THE FOLLOWING MATERIALS WERE ISSUED TODAY

MO.	DAY	YR.

NAME	AMOUNTS LBS.	AMOUNTS OZ.	TOTAL LBS.	TOTAL OZ.	PRICE PER LB.	TOTAL COST

ENTERED		
STORES TAG	BAL. ACCT.	COST SHEET

STORES DESCRIBED ABOVE HAVE BEEN ISSUED
SIGNED BY STOREKEEPER OR HIS REPRESENTATIVE

FIG 2—*Sample Sheet Used in Dye House*

The order points should take into consideration the time required to receive goods after they have been ordered, and should be large enough to give a good factor of safety should the goods go astray.

At this plant an elaborate stores system has been worked out, but only those modifications which are of interest to the laboratory are given.

This paper is presented merely to show how one laboratory has made an easy routine of the matter. Undoubtedly changes can easily be made in this system to fit it to other mills.

Any perpetual inventory is of little value unless a careful check is made occasionally.

A system as outlined above has the following advantages:

1. It insures an adequate supply of dyestuffs and chemicals at all times to take care of special requirements.
2. It minimizes the accumulation of dead stock.
3. It prevents any shortage of regular supplies.
4. It allows small stocks to be carried with a rapid turnover and small investment of capital.
5. It keeps the buyer in constant touch with his stocks.
6. Three years' successful operation proves its practicability.

DYEING WINDOW SHADE MATERIAL

Fabrics of the nature of window shade cloth are not dyed in the ordinary sense, but are lightly dyed some shade similar to the finished shade desired. For instance, a dark green would be first dyed with a direct green, while the blue would be dyed a light shade of medium blue. Some manufacturers might dye both fabrics first with a gray. This preliminary dyeing is not for the purpose of giving color to the finished fabric, but rather to hide the cotton fabric when the finishing color begins to wear off; in other words, to prevent the cotton from "grinning through," which it would surely do if it was undyed.

After this preliminary dyeing, the goods are passed through a more or less thin paste made of starch, in which is incorporated the proper color to give the desired shade.

For a blue, the base color may be a Prussian blue (a pigment, not a dye) and shaded with either lampblack or aniline black lake, in order to tone down the brightness of the Prussian blue. A green shade is produced with a mixture of Prussian blue and chrome yellow (another pigment).

The color mixer makes his trials by compounding these pigments in their proper proportions as previously determined by careful trials, together with the starch paste, together with some alumina hydrate, also in paste form. A typical recipe for a green is as follows:

Prussian blue	36¼ pounds
Chrome yellow	18¾ pounds
Alumina hydrate	32½ pounds
Starch	100 pounds

The starch is first made into a paste with cold water, then boiled until the mass is quite smooth. Then add the alumina hydrate, and incorporate well into the mass by stirring, and finally add the pigments. Of course, as before stated, careful trials must be made to determine the exact proportions of all the ingredients, and especially the water, since the consistency must be just right for the character of the cloth to be coated.

The appliance by which these pastes are applied to the cloth consists of a sort of padding machine, provided with a trough through which the fabric passes, from which the cloth is led over scrapers or "doctors" and finally dried. Heavy shades may pass through the "pad" two or more times in order to insure good impregnation of the cloth, and hence opacity.

After being impregnated, the cloth is read to be coated, which may be done by means of a special linseed-oil composition or dressing; or with caseine; or with one of the nitro-cotton varnishes soluble in amyl acetate or acetone.—"Canadian Dyer & Color User."

Impurities in Water Which Affect Dyeing

Matters in Solution and Suspension Concern Dyer—Former More Difficult to Deal With—Some Simple Qualitative Tests—Effects of Hardness and Removal of Same—Presence of Iron

By T. HADFIELD

(*All rights reserved.*)

THE solvent power of water is so considerable that all kinds of water contain a varied amount of mineral, vegetable, animal and gaseous matters in suspension and in solution the nature of which varies according to the subsoil and the impervious stratum of the districts through which the water drains. Water draining from moorland will contain iron and vegetable matter, while water passing over rocks, as limestone and granite, will contain magnesium and lime. Apart from the "softening" or "hardening" ingredients there is in most waters a varied amount of organic matter (vegetable and animal) in suspension and solution.

Simple Qualitative Tests for Suitability

The natural impurities which concern the dyer are the matters in suspension and solution. Those in solution are the most important, as matters in suspension are readily removed by filtration. The matters in solution are more injurious, and much more difficult to remove, as it involves the employment of chemical and mechanical methods. In many cases a qualitative examination of a specimen of water will afford sufficient criterion of its suitability for industrial purposes. The following simple tests will be found useful:

Hardness.—To a small quantity of water in a large test tube add a little of Clark's "Soap-test," and shake, when the degree of turbidity produced will afford a rough indication of the degree of hardness.

Chlorides.—Acidify a little of the water with nitric acid, and add a few drops of silver-nitrate solution. Four grains of sodium chloride per gallon gives a slight turbidity, ten grains a slight precipitate, and twenty grains a considerable precipitate.

Organic Matter.—Add to a few ounces of the water sufficient dilute solution of potassium permanganate to produce a faint pink color. The solution will gradually become decolorized, the rapidity depending on the amounts and characters of the organic matter present.

Sulphates.—Acidify a little of the water with hydrochloric acid, and add a few drops of barium-chloride solution. A white turbidity will be produced, varying in amount with the quantity of sulphates present.

Free Ammonia.—Add to a sample of the water a few drops of Nessler test, and note degree of brown or yellowish coloration produced.

Nitrates.—Mix a little of the water with twice its bulk of pure sulphuric acid, then add a drop of a solution of pyrogallic acid. A pink-blue color, changing to brown, indicates nitrates.

Nitrites.—Acidify water with sulphuric acid, and add a little pure potassium iodide, followed by a little freshly prepared starch solution. A blue tint indicates the presence of nitrites.

Lead or Copper.—Acidify some of the water with hydrochloric acid, and add a little sulphuretted hydrogen water. Any brown coloration indicates lead or copper. Or the water may be stirred with a glass rod dipped in ammonium sulphide, and color noticed.

Temporary and Permanent Hardness

Magnesium and lime, if present in water, have a very injurious influence, as they possess the property of precipitating soap solutions. In all operations where large quantities of soap are employed, the use of hard water entails a considerable loss. Therefore, the temporary and permanent hardness should be determined by means of Clark's method—1 c.c. of soap solution equals 1 deg. of hardness.

For all industrial purposes, and especially dyeing, bleaching and washing, all waters should be tested for "hardness," as many disadvantages occur, with loss of time and money. One great disadvantage is that the

precipitated earthy soaps are more or less of a sticky nature, and adhere so tenaciously to the cloth or fiber that they cannot be removed by ordinary processes. In the scouring of animal fibers, as wool and silk, they render the fiber more or less impermeable, so that neither the mordant nor the coloring matter can be afterwards properly fixed, and irregular development of the color results. In many cases the precipitated earthy soaps act as mordants and so cause endless trouble, as any lime soap precipitated in the fabric would attract coloring matter and thus produce a variety of stains.

Hard Water in the Dye Bath

Many fabrics are "soaped" after dyeing, and if the water is hard the precipitated earthy soaps give a greenish color to the finished fabric, and in many cases the colors lack brilliancy and the value of the fabric is much reduced. If hard water is used in the dye bath the coloring matter is very imperfectly extracted, and insoluble compounds are produced with alkaline earths, which are precipitated and rendered inactive. Hard water acts injuriously upon dyes and mordants: in the first case by dulling the color and causing irregularly colored cloth; and in the case of mordants, by neutralizing and precipitating basic salts, thus making the mordant less effective.

Water containing bicarbonates of calcium and magnesium should not be used for dissolving coal-tar colors, as in many cases the color base is precipitated as a tarry mass and much of the coloring matter is wasted, and if fabrics are dyed with such solutions they are apt to be spotted. In order that no defects shall result from the use of hard water, it should be first treated by Clark's method, according to the degrees of hardness, with lime or soda, and the water afterwards passed through the permutit process, as the permutit could be adopted that would clear the water from all impurities. The permutit may be calcium, magnesium, manganese, etc. The manganous permutit has the property of removing small quantities of iron from solution and destroying bacteria and organisms present in water; so that any kind of permutit can be used according to the nature and requirements of the treated water.

Presence of Iron Should Be Guarded Against

Iron is another impurity which may cause much mischief, and should be tested for by evaporating a little of the water, and if a reddish deposit is produced it should be treated with a little hydrochloric acid and heated with a little potassium chlorate. The solution is then diluted and cooled, and then a little potassium ferrocyanide is added, whereon a blue precipitate is deposited if iron is present.

Iron acts even more injuriously than calcium or magnesium precipitating soap solutions. In wool scouring, bleaching and dyeing operations, where alkaline carbonates are used, ferric oxide is precipitated on the cloth, which causes dull shades, and bleached cloth acquires a yellowish tinge that cannot be removed by ordinary methods, thus making the cloth unsalable. Water containing free acids, as ulmic and humic acids from peaty water, attack iron, and may indirectly cause much mischief, and especially in the dyeing operation. The water should be tested with blue litmus, and if found distinctly acid it should be neutralized with a little sodium carbonate.

Of the gases in solution, sulphuretted hydrogen is the most common, and is detected by a strip of filter paper saturated with acetate of lead being placed over a flask containing the suspected water, which has been previously acidified with a little acetic acid. The filter paper turns brown if sulphuretted hydrogen is present in the water. This gas forms sulphides with metal mordants, thus producing black and brown stains.—"Textile Manufacturer."

NOVEMBER DYE EXPORTS TOTALED HALF-MILLION

Domestic exports of dyes and dyestuffs in November totaled $500,918 in value, according to figures of the U. S. Bureau of Foreign and Domestic Commerce. Forty-one foreign countries or localities shared in the receipt of these goods, the month's exports of aniline dyes being valued at $374,244, of logwood extract at $49,971, and of all other dyes and dyestuffs at $76,703.

This trade by countries was as follows:

Countries	Aniline Dyes	Logwood Extract	All Other
Belgium	$7,624	....	....
France	478	$604	$446
Germany	....	2,450	....
Italy	....	336	....
Netherlands	....	545	300
Norway	1,800	....	....
Spain	3,404	....	148
Sweden	....	....	5,642
Switzerland	....	....	19
England	....	3,106	3,400
Bermuda	....	....	14
British Honduras	....	....	23
Canada	62,977	12,971	49,094
Costa Rica	135	....	23
Guatemala	87	....	48
Honduras	....	....	98
Nicaragua	....	....	27
Mexico	8,289	....	2,848
Newfoundland and Labrador	1,944	....	59
Jamaica	170	....	....
Cuba	2,247	....	302
Haiti	....	....	28
Dominican Republic	....	....	10
Argentina	7,315	200	450
Brazil	1,847	1,976	....

Countries	Aniline Dyes	Logwood Extract	All Other	Countries	Aniline Dyes	Logwood Extract	All Other
Chile	257	....	....	Japan	227,681	27,135	10,404
Colombia	116	174	1,831	Palestine and Syria	926	....	....
Ecuador	3,196	....	....	Australia	24,920	390	....
Peru	174	84	188	New Zealand	....	....	705
Uruguay	....	....	117	French Oceania	11	....	....
Venezuela	2,911	....	144	Philippine Islands	1,470	....	....
China	29	....	....	British South Africa	5,233	....	279
British India	6,959	....	1,756	French Africa	344	....	....

Things Every Textile Chemist and Colorist Should Know

[Note—Under this heading will be introduced as a more or less regular feature the discussion of various fundamentals which should be a part of every textile chemist's and colorist's working knowledge. It is hoped that such discussions will instruct some of the younger readers, and serve as a review for those of broader experience and knowledge.]

No. 2

Two Types of Bleaching: Oxidation and Reduction

IN the field of chemical action we have two very important processes, namely: oxidation and reduction.

In general, oxidation is a reaction brought about through the action of the element oxygen which usually consists in the direct chemical addition of that element to some other element or compound. As a result there is usually formed a compound containing a higher percentage of oxygen than the substance which has been oxidized, but in some instances the oxidation of a substance brings about complete decomposition with the formation of a number of simpler compounds.

Reduction, on the other hand, is a reaction which involves the removal of oxygen from some substance, and usually results in a pronounced change in its chemical constitution and properties. Many dyestuffs, for instance, are converted into colorless or entirely different colored compounds upon reduction.

While the terms oxidation and reduction are intended to indicate quite different results, as actual processes they are oftentimes inseparable, and one specific chemical reaction may involve both. Thus, when carbon monoxide is passed over ferrous oxide which has been heated to a high temperature, metallic iron and carbon dioxide are formed according to the following equation:

$$FeO + CO = Fe + CO_2$$

This reaction is fundamentally one of reduction, the iron oxide being reduced to metallic iron; but, on the other hand, it may be said that the carbon monoxide has been oxidized to carbon dioxide.

All of the practical processes of bleaching involve either oxidation or reduction. Oxidation methods are the most extensively used, being applicable to both vegetable and animal fibers. Reduction methods, while very effective for the bleaching of animal fibers, are of little if any use in the bleaching of vegetable fibers.

In the bleaching of cotton, dependence has always been placed upon the oxidation method, although the oxidizing action has been brought about indirectly through the use of chlorine or certain unstable chlorine compounds like the hpyochlorites, which readily liberate chlorine under certain conditions.

It should be remembered that it is only nascent oxygen—that is, oxygen in the atomic condition with free bonds of valance—that is effective in bleaching. In other words, molecular oxygen, which is present in the air, represented as O_2 or $O{=}O$, has practically no bleaching action, but oxygen in the atomic condition, expressed as $O{=}$, is extremely active as a bleaching agent. Atomic chlorine, known as nascent chlorine, quite readily reacts with water according to the following reaction:

$$H_2O + (2Cl{-}) = 2HCl + (O{=})$$

i. e., water + nascent chlorine = hydrochloric acid + nascent oxygen.

The nascent oxygen thus liberated is the active bleaching agent when chlorine is used.

The following experiment with chlorine and colored cotton cloth, so frequently performed by students of elementary chemistry, quite vividly demonstrates one reason for believing that it is the nascent oxygen and not the chlorine that brings about the bleaching: In one jar of dry chlorine gas place a strip of dry cotton cloth dyed with almost any basic or direct cotton color.

In another jar of the same chlorine place a similar strip of dyed cotton which has been moistened with water. While the latter is decolorized very rapidly, the former may not show any change for a number of hours.

The hypochlorous acid which is liberated from bleaching powder readily decomposes as follows:

$$HClO = HCl + O$$

i. e., hypochlorous acid = hydrochloric acid + nascent oxygen.

Numerous other reactions take place during the bleaching of cotton with chlorine compounds, but the belief generally accepted to-day by textile chemists is that the nascent oxygen liberated is the most effective bleaching agent.

If this is true, one would naturally expect nascent or atomic oxygen from other sources to bleach cotton, and such seems to be the case. Another simple source of nascent oxygen is the decomposition of peroxides, thus:

$$H_2O_2 = H_2O + O$$

i. e., hydrogen peroxide = water + nascent oxygen.

Peroxide solutions prepared directly from hydrogen peroxide, and indirectly from other peroxides—particularly sodium peroxide, Na_2C_2—prove to be very effective for the bleaching of cotton. Other typical oxidizing agents like sodium perborate and potassium permanganate also readily bleach cotton.

In the early days of the industry all attempts to bleach wool by the use of the hypochlorites demonstrated the hopelessness of any satisfactory methods from this source. Instead of bleaching wool it turned it to a decided yellow color.

It was discovered that gaseous sulphur dioxide quite readily bleached wool, particularly if exposed in a moist condition to the action of this gas.

The sulphur dioxide reacts with the water, forming sulphurous acid according to the following reaction:

$$SO_2 + H_2O = H_2SO_3$$

i. e., sulphur dioxide + water = sulphurous acid.

Sulphurous acid is a recognized reducing agent, extracting oxygen from many substances according to the following reaction:

$$H_2SO_3 + O = H_2SO_4$$

i. e., sulphurous acid + oxygen = sulphuric acid.

The coloring matters naturally present in wool are of such a character as to be decolorized, but not destroyed, by the action of reducing agents. This has been demonstrated by the use of other reducing agents, such as the hydrosulphites, but upon exposure to air the original color is quite likely to return slowly.

As a result of the simple, cheap and, for the most part, effective bleaching action of sulphurous acid upon both wool and silk, this reagent was used with these fibers exclusively for many years; and, in fact, this practice is extensively continued at the present time.

When it was rather definitely settled that it was nascent oxygen rather than chlorine that bleached cotton, textile chemists naturally tried other oxidizing agents on wool, with the result that hydrogen peroxide was found to bleach wool quite effectively without any of the detrimental effects of chlorine. As a result the peroxides have become extensively used in wool and silk bleaching in recent years.

It would therefore appear that the natural coloring matters of wool are of such a character as to be quite readily decolorized by either a reducing or an oxidizing process. It is also evident that with the oxidation bleach there is a more permanent change in these coloring matters than in the case of reduction. This, however, may be due to the fact that exposure to the air after bleaching is, if anything, a continuation of the oxidation process, while this same exposure after a reduction bleach amounts to a reversal of that process.

As compared with the processes using chlorine, the peroxide process has been found to be too expensive for the bleaching of cotton material on the large scale. As a result it is used only in the case of straight cotton material for the bleaching of hosiery, special fabrics, and sometimes in laundries.

One very valuable use, however, is made of the peroxide bleach. Union fabrics composed of cotton combined with wool or silk, or both, could not be bleached with chlorine in any form; for while this would be effective with the cotton, it would not only fail to bleach the wool and silk, but would, on the contrary, turn them a more pronounced yellow. On the other hand, the reduction bleach with sulphurous acid would be effective as far as the wool and silk were concerned, but would have no effect upon the cotton. In the peroxide bleach, however, we have a process which works reasonably well with both fibers under a similar treatment, and for this purpose the peroxides have found an extensive use.

The Peerless Hosiery Dyeing Company, which recently completed its new plant at Pleasantville, N. J., has started operations. Harry E. Brewin is president and treasurer and E. K. Biggard is secretary and general manager. Both were formerly with the Peerless Silk Dyeing Company, of Philadelphia, Pa.

The Erlanger Underwear Manufacturing Company, Baltimore, Md., has started construction work on a one-story plant at Crisfield, Md., to be 10 by 120 feet, and estimated to cost about $25,000.

The German Vegetable Fiber Industry

Remarkable Results Accomplished in Use of China-Grass, Australian Seaweed and Jute in Place of Woolens and Worsteds

THE attention of textile manufacturers has been attracted to the remarkable results that are being attained in Germany in the manufacture of yarn from grasses, plants, leaves, etc. This new German industry is centered in the plant of the Deutsche Faserstoff-Gesellschaft (German Fiber Material Company), situated at Fuerstenberg, in Mecklenburg.

According to a report by the representative in Germany of the United States Department of Commerce, this plant was established in 1912. During the first year in which it was in operation it confined its activities to the manufacture and sale of the fibers. In 1913 spinning machinery was set up, and since then the spinning has been continued on an ever-increasing scale. The fibers dealt with include china-grass, Australian seaweed, jute, old jute rags and shoddy worsted yarn. In addition, a number of other fibers were worked up during the war. Some were abandoned afterwards, as the supply to be found in Germany was not sufficient to warrant their permanent use. Among these fibers are nettle, hops, willow bark, pine needles, cornstalks, ginster and asparagus. With the fiber taken out of pine needles and cornstalks, a very strong and tough paper can be produced.

Prior to the outbreak of war, the Deutsche Faserstoff-Gesellschaft was able to secure sufficient supplies of china-grass, Australian seaweed and jute, and it focussed its efforts on these fibers. During the war the imports of this raw material were cut off, and had not at the date of the report been resumed. Since the close of the war this concern has confined itself mainly to the manufacture of yarn from old jute rags.

Solidonia Fiber Resembles Wool

The vegetable fiber derived from china-grass is known as solidonia, and is similar to ramie. The Deutsche Faserstoff-Gesellschaft, by means of a special process, produces a long, fine, soft and curly fiber. The curliness of the solidonia fiber presents a special feature. The fiber looks very much like wool, and mixes readily with that product, thus opening a wide field for its use in the woolen industry.

In Germany, solidonia gained a wide field of use on account of the shortage of wool during the war. As a substitute for linen, solidonia has been used in Germany for the manufacture of table linen of beauty and strength. It has also been used for machine belting. German hosiery and underwear mills have produced from it socks and stockings which are difficult to tear, unshrinkable underwear, and sporting jackets of fine quality and strength.

Various Uses

The German woolen mills have manufactured an army cloth which, composed of 75 per cent wool and 25 per cent solidonia, it is asserted, surpasses in tensile strength any pure-wool cloth. Similar results are claimed with respect to paper-makers' felts, which, with a percentage of solidonia mixture, show a considerable increase in strength. Furthermore, women's and men's clothing composed of half solidonia and half wool or shoddy, especially in piece-dyed goods, have found a ready market. In textile circles in Germany it is declared that there is an unlimited field for the use of this fiber. Previous to the war the price of solidonia in Germany was two-thirds the cost of good staple wool. No post-war comparison can be given, as none of this raw material is being imported into Germany. In 1914 solidonia in the carded stage found a ready market at 30 cents a pound, delivered in New York or Boston.

Posidonia Declared Equal to Medium Staple Wool

Another fiber from which the Deutsche Faserstoff-Gesellschaft has obtained splendid results is the fiber known as posidonia. This is also a vegetable fiber. It is derived from seaweed, which is dredged in Australia and cleansed and washed in sweet water. Brought to Germany, the fiber is subjected by this concern to a chemical treatment for the purpose of softening it and making it resilient, the original fiber being stiff, harsh and brittle. The staple of this fiber is declared to be equal to a medium staple wool, and it is spun on the worsted and woolen system. It is characterized by elasticity and springiness, and the cloth which is made out of pure posidonia appears to show scarcely any creases. German cloth mills have mixed posidonia with wool or shoddy, and cloth of good strength and appearance has been obtained. It is believed that this fiber, by reason of its springiness, will have a wide field of use in the carpet industry. This raw material was sold at half the price of shoddy before the war; since the war none of this has been imported into Germany.

Use of Jute for Worsted Yarns

Some unusual results have been obtained with jute

by the same company. By a special process of chemical treatment a long, fine and beautiful fiber is being produced therefrom, a fiber which can readily be spun on the worsted system, pure or mixed with wool. Shoddy made from old jute rags can also be spun on the worsted or woolen system. Serges made from old jute rags or cloth made from half wool and half jute, wool or piece dyed, are used for women's costumes, overcoating, etc. Furthermore, sweaters and vests are being made from all-jute worsted yarn, and it has been difficult to recognize them as being made of such. The Deutsche Faserstoff-Gesellschaft claims that jute represents the cheapest fiber suitable for worsted yarn that has been discovered.

The Deutsche Faserstoff-Gesellschaft has, moreover, succeeded, by a special opening process, in manufacturing shoddy of sufficiently long staple to spin a high-grade worsted yarn from it.

This plant began work with a total of fifteen employees. Its personnel now numbers over 250. The buildings have been enlarged and new ones erected, and plans are on foot to make still greater additions.—"Journal of the Royal Society of Arts."

A Historical Survey of Dyeing

Experience Teaches that Dyers Must Work Hand in Hand with Science—More Progress Made in Past Sixty-five Years than in Preceding Thousands, When Dyeing Secrets Were Guarded—Next Half-Century Should Produce as Much Again

[From a paper read before the Halifax Branch of the Foremen Dyers' Guild, owners of the copyright.]

By C. E. BARRACLOUGH

IT is a remarkable fact that there is not a textbook treating of dyeing published in recent years which makes any mention of the history of the subject. I hope, therefore, that this paper will prove at least interesting, because of its novelty, and at the same time instructive. I think it is sometimes an advantage to look backwards and obtain in that way a change of view upon many subjects and at the same time a broader and better understanding of our art.

Instinct for Color

I do not intend to give references to the various old authorities, but will content myself with saying that as far as possible I have only used those statements which have from time to time been accepted as facts. The art of dyeing no doubt originated in that love of distinction and personal adornment inherent in the human being, inducing man, for its gratification, to stain first his skin and then his dress with the gaudy colors of the vegetable kingdom. It has struck me, during the large volume of reading that I have been through in the preparation of this paper, that the first and earliest dyestuffs were derived from the vegetable kingdom, and it is not unreasonable to surmise that this is so because of the fact that it is in the vegetable kingdom that nature makes her most vivid display of color, and that man, in his desire to reproduce these colors for his own adornment, made the earliest discoveries in the art of dyeing.

The earliest historical records speak of colored garments being worn as marks of distinction for offices, both political and religious, and also as marks of favor. Jacob gave his favorite son Joseph a coat of many colors, and Moses speaks of a raiment dyed blue, and purple and scarlet, and of sheepskin dyed red; circumstances which indicate no small degree of tinctorial skill. Moses commanded purple for the robes of the high priests and for the works of the Tabernacle.

Dyeing in Egypt

From modern research into the early life of Egypt it is quite clear that the ancient Egyptians had quite a remarkable knowledge of dyeing, being acquainted with the production of dyes on mordants, and also with the application of indigo.

Of course, these facts have been arrived at by the examination of mummy cloths of various periods. It is highly probable, however, that the art of dyeing is very much more ancient than even the ancient civilization of Egypt, and most probably dates back to the first Eastern civilized races of China and Hindustan. The earliest really historical mention of dyeing of any note is, however, in connection with the famous Tyrian purple.

Tyre, the capital of Phœnicia, was in those remote days a Manchester of antiquity, and became famous for the dyeing of this beautiful and permanent purple about 1500 B. C.

This purple must have met with a very early and general appreciation and rapid commercial success because we find that, nine years after the above date, the children of Israel, an enslaved people, on their leaving Egypt had

in their possession large quantities of this dye. In later years this dye was always named amongst the spoils of war.

That it was the dress of royalty at a very early period is indicated by the mention among the spoils of the Midians collected by the Israelites of the purple garments worn by their kings.

Pliny says, "The Tyrians first dyed their wool in the liquor of the purpua and afterwards in that of buccium; the purple mentioned in Exodus, chapter xxv, was also twice dyed. Wool which had this double Tyrian dye was so costly that in the reign of Augustus each pound of it sold for 1,000 Roman denarii (about £36 sterling). But, lest this should not sufficiently exclude the use of it from all who were not invested with the highest dignities, laws were made inflicting severe penalties, and even that of death, under the later emperors, upon all who might unlawfully presume to wear it.

Thus the art of dyeing this color came to be practised by a very few whom the emperors maintained for that purpose; and it being interrupted by wars about the beginning of the twelfth century, all knowledge of it was soon after lost except what remained in the older writings, and during several ages this celebrated dye was considered and lamented as an irrecoverable loss. Of course, it will be known to all that this dye was made from a small shell-fish (a mollusc) and that it has now been identified as being a Brom-Indigo.

The earliest important event in the history of dyeing was the discovery of the effects of bases as mordants, and particularly that of alum in the fixing of adjective coloring matters.

Hindu Origin

When or where this discovery was first made cannot be ascertained, but there is, however, good reason to think that the Egyptians borrowed this art from Hindustan, where it has existed for more than 2,000 years, probably with very little variation or improvement during that long period of time; and if we are to judge by the means formerly employed in Hindustan for dyeing or staining calicoes by those which were found to be in use when the Europeans first went there by the Cape of Good Hope, we may safely conclude that solutions of alum and of iron must have been the mordants employed for fixing their dyes

The very early use of alum by the Egyptians and Hindustani is probably accounted for by the fact that in some parts of Egypt and Hindustan a natural crystalline form of alum is found to exist, and it probably was in this form that its good effects in dyeing had first been observed before man was led to the means and operations since employed for separating it from the various aluminous ores.

No records are available regarding the operations carried out and the processes invented by the ancient Romans, but it is certain that they were acquainted with the use of such products as madder, woad, nutgalls, alkanet root, and with the application of blue and green vitriol, alum and some salts of lead. According to Discorides and Pliny, indigo was known in Europe and, although scarce, was regularly imported from India, whence it derives its name. I shall have reason to refer to the use of indigo in England at a later stage of my paper.

It is really a wonderful thing to reflect upon that the natives of India knew how to render indigo soluble and to be able to use it as a dye although the Greeks and Romans, always considered much more advanced races, do not appear to have possessed this knowledge.

It is interesting to note that the first manufactory for alum in England was established in the reign of Elizabeth at Guisborough.

The Romans, however, do appear to have bestowed some care on the art of dyeing, and we have mentioned by Pliny the fact that the circus members in their games were distinguished by colors—four of these being green, orange, gray and white.

In Europe the progress of dyeing—as indeed all other arts—was for a long period stopped by the wars and invasions of those barbarous nations who came from the northeast of Europe, excepting in a small portion of Spain. This stoppage lasted throughout at least five centuries.

But for the establishment of this Saracen Colony in Spain it is very likely that the old art of dyeing would have been completely lost, but these so-called Saracens succeeded in establishing a settled state of society and, as their written records show, attained a high degree of perfection in such arts as paper making, sugar refining, and the extraction of dyes from native vegetable produce.

They were, doubtless, aware of the manner of producing Turkey red, as the means of producing that dye on tissues was known at the time at Adrianopolis in Turkey.

Slow European Progress

The art of dyeing did not revive in Europe until the beginning of the thirteenth century, and then so rapidly did its progress extend in some directions that towards the beginning of the fourteenth century there were no less than 400 dye houses in Florence.

About this time the Italians and Venetians also largely practised the art, and it is extremely likely that the Jews were the greatest dyers at this period, especially so in Florence.

The art of printing (*i. e.*, of manuscripts) proved for dyeing, as well as for other arts, its great propagator, and in 1429 the first collection of processes used in dyeing was printed and published at Venice under the name of "Mariegola del'Arte du Tuitori," of which another and much improved edition was printed in 1510.

From this book an individual named Giovanni Ventura Rosetti, who traveled Italy and the neighboring countries to learn the methods and means employed in dyeing, composed and published in 1548 a work under the title of "Pliithos Art of Dyeing." This book has always been considered to have contributed more to the improvement of the art than any other.

M. Berthollet pointed out that in this book there is no mention of either indigo or cochineal, and it is therefore assumed that these two dyestuffs were not known to the Italian dyers of the period, *i. e.*, 1548 and thereabouts.

The Royal Society

In 1662 the Royal Society, upon its first institution, bestowed some attention to the subject of dyeing, and at the same time Sir Wm. Petty, one of its members, brought in a paper entitled "An Appendix to the History of the Common Practices of Dyeing," which seems to have been the first account published in the English language of the means and operations employed in the art of dyeing. Nearly two years afterwards Mr. Boyle presented to the Royal Society his "Experiments and Considerations Touching Colours," and shortly afterwards it was ordered by the Society "that the way of fixing colours should be recommended to Mr. Howard, Mr. Boyle and Dr. Merritt."

The work of these gentlemen did little to advance dyeing (the Mr. Boyle mentioned is the one who formulated the law in regard to gases, which to this day is known by his name).

Another member, Mr. Hooke by name, produced before the Society a piece of calico stained with yellow, red, green, blue and purple colors, which he said would endure washing with warm water and soap.

But from this time (1663) it does not appear that the learned scientific English did anything of note to advance the art of dyeing until a much more recent date.

Not so, however, in France. There, one of its ministers of State, viz., Colbert, anxious to extend the commerce and manufactures of that country, turned his attention particularly to the art of dyeing with a view to amend as well as to obviate frauds in dyeing. It was to this end that he had prepared in the year 1672 a book on the dyeing of wool.

This was afterwards embodied in an act which controlled dyers and divided them into two classes—those dyeing colors which were deemed "lasting" and those who were only allowed to dye "loose" colors.

Restraints of this kind must have operated to restrict progress had not the French Government offered large prizes and appointed eminent chemists—Dusay, Hellot and Berthollet—for the improvement of those arts allied to chemistry, especially the art of dyeing. This is, so far as I am able to find out, the first historical record of the alliance of chemistry and dyeing (1680), so that it is from this time that we note real progress.

The discovery of America and its opening to commercial enterprise formed an era in the history of the art of dyeing, as from that country were introduced a variety of new dyestuffs such as logwood, brazil wood, quercitron, cochineal, annatto, etc., which with the discovery of the use of tin compounds as mordants about the same time, gave the dyer a facility and power of producing shades of such a variety of tints and of such durability, depth and luster, that it is now difficult to conceive possible to have been produced in former times.

Indigo Denounced

I have already mentioned that, according to Pliny, indigo was known in Europe but it was not known in England until the time of Elizabeth (1560), and then there was such a protest against its employment that it was denounced as a dangerous drug and forbidden to be used by Elizabeth's Parliament.

An act was passed authorizing searchers to burn both it and logwood in every dye house where they could be found. This act remained in force until the time of Charles II, *i. e.*, for nearly a century, such was the affection which they had for their native woad with which their native sires used to dye their skins in the old times.

From the end of the seventeenth century to the middle part of the eighteenth century there was no very marked advance in dyeing, but with the introduction of steam as a motive power and also as a means of heating the various dye liquors a great change came over the art and large firms—many still in existence—came into being. Watt made his improved steam engine in 1764. It is of interest to note here, in relation to the use of steam for heating, that a friend of mine has recently made a tour of dye houses in the West Country and found many firms, noted for their beautiful West of England cloths, still heating their vessels with the open fire.

The next important—very important—step in dyeing was the introduction of chrome salts as mordants and also as a means of producing colors—chrome green and chrome yellow and orange.

The introduction of manganese as manganese bronze also marked an epoch but, of course, this is now practically obsolete.

A great impetus was given to dyeing by the establishment during the last century of schools of dyeing, and those of Leeds, Crefeld, Mullhouse, Manchester and Bradford are well worthy of special mention.

The late Professor Hummel, of Leeds, was almost a pioneer in what I may call the scientific study of dyeing, and his lectures were attended by students from all parts of the world.

I have known when, besides the English students, there were in attendance at Leeds, Germans, French, Belgians, Dutch, Spanish, Italian, Japanese, Chinese and Malattas.

His work, published by the house of Cassell, "The Dyeing of Textile Fabrics," was for many years the standard book on dyeing, although the late Sir Wm. Crookes compiled a book on "Dyeing and Calico Printing," but this was very largely a collection of recipes and patterns.

Hummel's work on "Chroming" was and is to-day considered a classic in dyeing research, and it was to his work that we owe the explanation of defects due to overchroming and the correct and now generally adopted methods of applying bichrome to wool.

Natural Colors

It is of passing interest to note that the dyeing courses at Leeds and Bradford, even as late as twenty years ago, always covered the natural colors, many of which are now quite obsolete, and it was always a puzzle to me to know why we should study dye patterns with such things as madder, camwood, weld, quercitron, peachwood, barwood and lac dye.

Some of these I find in use even to-day, among them being peachwood, weld and lac dye; in fact, I have only recently sold two tons of lac dye.

The greatest impetus was given to the dyeing industry by the epoch-making work, or discovery, of Perkin.

Runge, in 1834, discovered a substance in coal tar to which he gave the name of Kyanol, because it produced a blue color with bleaching powder solution, but this reaction merely remained a scientific fact until Perkin, in 1856, for the first time succeeded in producing on a large scale a violet coloring matter, which he obtained by treating a solution of aniline with bichromate of potash. This coloring matter he termed mauve.

Rapid Progress

From this time progress in color making went on by leaps and bounds. We have in rapid succession quite a galaxy of colors; 1858 Hoffmann's violet, which, although produced only two years after Perkin's mauve, almost superseded it. At the same time he discovered and made magenta. In 1861 Girard made the phenyl violets and aniline blue; in 1862 Nicholson made the soluble blues, the so-called Nicholson blue. In 1862 also was made aldehyde green. In 1867 Paris or methyl violets were made and exhibited at the Paris Exhibition of that year.

I now come to the influence which the introduction of machinery had upon the art of dyeing. It has already been mentioned that Watt made his steam engine in 1764, but it was not for many years that the old hand cisterns for dyeing became gradually replaced, and then only by the simplest means.

It does not appear that anything worthy of the name of a dyeing machine was made until the Obermaier was introduced about 1887.

This machine introduced quite a new principle, viz., the circulation of the liquor whilst the material to be dyed remained stationary. The machine had a good reception and was the forerunner of all present-day machines of that class.

That other very well-known and much-respected machine, the Klauder-Weldon, was of somewhat later date, and the principle there is, as you all know, just the reverse.

The cop and beam dyeing machines, the various warp dyeing machines—all too numerous to mention—are all really milestones in the history of dyeing and have very largely been rendered possible by the introduction of synthetic dyes of a very soluble character.

After this rapid survey of the history of dyeing it is only natural to ask oneself: What does it teach us? To me it seems to point very clearly to this—and I don't want to labor the point: An art such as yours must run in double harness, you must join hands with science. From the day of Perkin in 1856 to now is only sixty-five years, and yet the progress made in those years is more than all the progress of the thousand years when dyeing was a jealously guarded secret.

As dyers, you should be in ever constant touch with those in kindred occupations. The dyers' relations with the color makers, chemists, engineers and the manufacturers of the materials which he is called upon to dye should be of the closest possible, as it is by such association that problems will be solved and the new ideas and processes to work them out evolved.

The Future

In conclusion, I want to take a peep into the future and speculate as to the most probable developments that are most likely to take place.

I hope to see before many more years the use of wood for dye vessels entirely superseded by a non-stainable and absolutely smooth material. I can already see steps—and marked steps—being taken in this direction.

Some will know the product to which I refer, but as I am not in any way wishing to advertise any maker's goods, I shall not mention the name.

I also hope that within a few years all wool goods will be made "moth proof." This problem has been attacked by the German color firms, and from samples and tests which I have seen and made I think that, except in a matter of cost, the problem can be considered solved.

There has been for some ten or twelve years now in Germany a crusade—under Dr. Krais, late chief chemist to the B. S. A.—for the use of only the fastest dyes, and the Germans are leaving no stone unturned to inculcate this idea into the various markets of the world.

It seems to me to be only a question of time before only the very best alizarine and acid chrome colors will be demanded as well as, of course, the vat colors.

The group of vat colors is being rapidly developed and I have private communications from some German color firms that within a comparatively short time a full range of shades of this type of color will be available for dyeing all shades on both animal and vegetable fibers. Another probability is the production of the actual colors on the fibers themselves.

Developed Dyes

A beginning was made by Professor Green's invention of the ingrain colors.

It led to the dyeing of fast shades on cotton by the diazotizing and developing processes leading to para red and similar colors.

Shortly before the war the introduction of Naphthol AS again brought this method to the foreground, and it

is quite likely that the time may soon come when any fast shade on cotton may be produced by this method. The introduction of pressure and vacuum dyeing machinery afterwards are other matters on which work has already been done.

In conclusion (again) I think that we shall see at least as much progress during the next fifty years as we have in the past fifty years, and societies like yours will no doubt contribute largely to such progress.—"Dyer and Calico Printer."

The Dyeing and Printing of Foulards

Types of Foulards—Strength of Boiling-Off Bath—Bleaching for Clear Tones—Colors Available for Printing —Method of Dyeing—Cold Discharges

THIS particular class of silk fabrics and those most closely related to it in structure and design comprise a most important group of textiles which occupy a prominent position in the silk market, and which are constantly increasing in popularity. While other fabrics appear from time to time, and for the moment appeal to the popular taste, the fact remains that the silk foulards retain their own position, and the new aspirants gradually pass into oblivion.

Silk foulards are generally made according to two distinct methods, viz.: direct printing of suitable colors upon the fabrics, or by dyeing the fabrics first with some solid color, and then discharging white or colored patterns upon it. Resist or reserve effects are sometimes printed upon the white cloth, and afterwards the goods are dyed, certain effects being thereby obtained; but this latter method is not frequently used.

Direct printing for light, fancy, single or varicolored effects is the most common method and is one which allows a very broad field for the ability of the designers.

Before being printed, the fabric should be very thoroughly inspected in the gray, and all defects of weave, loose threads, knots, blebs, etc., removed; afterwards the pieces should be carefully singed and then boiled off.

Boiling Off

Boiling off of silk pieces requires the same care and attention to detail as that of silk skeins; only the softest water should be used, and the soap ought to be a pure olive-oil soap. If hard water is to be made use of, it should be treated with a sufficient quantity of soap, before putting in the pieces, to precipitate all lime and magnesia present, which can then be skimmed off. The pieces may be handled either in the rope form or over a winch; this latter is a very common method, and allows the fullest opportunities to observe the progress of the work. Fine texture fabrics may be wound on the spider wheels, which permit many yards to be handled on one wheel without any lap touching the previous one.

The strength of the boiling-off bath should be between 11 and 20 ounces of soap per 10 U. S. gallons, and the fabrics should be worked in this liquor at the boil for at least one hour. Some concerns use two soap baths, the first bath being a previously used bath and the second being a fresh soap bath, which when once used then becomes a first bath for the next set of pieces. When the pieces have been thoroughly freed from all traces of natural gum—all gum must be completely removed, especially if the goods are to be dyed solid colors; any that may remain will surely cause the fabrics to be unevenly dyed—they are then well washed in soft water containing about 20 grains of soda per gallon; this facilitates the removal of any trace of soap in the goods.

This is important, as it is well known that grease or fatty acids in silk will soon effect its destruction; therefore, for the best quality of mill output too much care cannot be given to insuring the complete removal of all soap from the pieces after they have been degummed. The presence of traces of soap or of lime (from hard water) is indicated in piece-dyed goods, for instance, by dark blue or deep brown, shady, clouded areas, etc., this being a sure indication that the washing has not been well done. It is unfortunate, however, that these defects cannot be located before dyeing.

Bleaching for Clear Tones

For very clear tones, and for certain styles, the pieces, before printing or dyeing, must be bleached. For this purpose hydrogen peroxide is most commonly used. The bleaching is carried out by laying the fabrics either in regular folds or in rope form in the bleach tank, covering them with a wooden lattice to confine the goods below the surface of the liquor. After bleaching, the goods are washed free from all bleaching agents and dried, when they are ready for dyeing or printing.

For ordinary figured effects on a white ground, the direct printing style is most commonly used. For this purpose colors of the Diamine or direct group are selected. These are capable of complete fixation by moderate steaming. When washed after steaming

(*Continued on page* 94.)

Proceedings of the American Association of Textile Chemists and Colorists

The American Association of Textile Chemists and Colorists

President
LOUIS A. OLNEY
Lowell Textile School, Lowell, Mass.

Vice-Presidents
WILLIAM D. LIVERMORE WILLIAM H. CADY

Secretary
WALTER E. HADLEY
5 Mountain Avenue, Maplewood, N. J.

Treasurer
WINTHROP C. DURFEE
516 Atlantic Avenue, Boston, Mass

Councilors
JAMES L. AMSDEN GEORGE A. MORAN
ELMER C. BERTOLET WILLIAM K. ROBBINS
ARTHUR E. HIRST WALTER M. SCOTT

CORRESPONDENCE

In the Proceedings published in the January 16 number, under the head of "Correspondence," reference was made to the official reply to the letter received from the Secretary of the Society of Dyers & Colourists at the time of the inaugural meeting in Boston. The publication of this letter was inadvertently omitted and it now follows below:

November 28, 1921.

A. SILVERWOOD, HON. SEC.,
SOCIETY OF DYERS & COLOURISTS,
BRADFORD, ENGLAND:

Dear Sir—Your letter of October 25, 1921, was happily though unconsciously well timed. It was received on the morning of November 3, just a few minutes before I left Lowell to attend the inaugural meeting of the American Association of Textile Chemists and Colorists, which was to be held that afternoon in Boston.

It was a great pleasure to read your letter at our meeting, and as a result the following resolution was unanimously passed:

"The newly organized American Association of Textile Chemists and Colorists sends greetings to the Society of Dyers & Colourists, and assures them of its co-operation in every way."

Replying more directly to your inquiry, we will say that there is no doubt but what some scheme of co-operation is possible and we trust that it may develop without too much delay. With this in mind, we would suggest that the British Society, from their thirty-seven years of valuable and successful experience, suggest for our consideration some of the ways in which they believe the newly organized American Association can best co-operate.

With cordial greeting to yourself and the Society which you have the honor to represent, I am,

Sincerely yours,
(Signed) LOUIS A. OLNEY, President.

THIRD COUNCIL MEETING

The Third Meeting of the Council of the American Association of Textile Chemists and Colorists was held Friday, January 13, at the Engineers' Club, Boston, Mass.

The following members were in attendance:

Prof. L. A. Olney	William H. Cady
William K. Robbins	W. M. Scott
George A. Moran	Winthrop C. Durfee
A. E. Hirst	W. E. Hadley
James L. Amsden	

William D. Livermore was absent, owing to his attendance as the representative of the Association at the meeting of the Dye Advisory Committee of the Textile Alliance, Inc., which was being held in New York the same afternoon.

A letter had been received wherein information was requested as to the qualifications for membership in the American Association of Textile Chemists and Colorists. Two gentlemen were seeking membership who were not textile chemists or colorists, although somewhat interested in matters pertaining thereto. In order to maintain the high standard of the Association, the President was authorized to write them a letter stating that they were not eligible for membership in the Society.

The Treasurer reported that there is at the present time a fair amount of money in the treasury of the Association and that all bills are paid to date. This money is held in reserve so as to cover requirements of each member of Local Sections, and as a reserve for paying for publication of proceedings after first six months.

There are still some members who have not paid their dues for 1922.

A letter was read from E. H. Killheffer requesting permission for the formation of a New York Local Sec-

tion. The petition was duly signed by thirty-eight members of the Association.

It was voted to authorize the formation of above Section, and E. H. Killheffer was elected Secretary pro tem., with authority to proceed with the formation.

The geographical boundaries of above Section were defined to include New York State and northern New Jersey.

The following applicants for membership in the Association were formally admitted to membership as designated, these names having been duly presented to the members of the Association in accordance with Article IV of the Constitution:

Admitted to Active Membership—

William C. Dempster, 644 Greenwich Street, New York, N. Y.

Edwin J. O'Brien, 2207 Dorchester Avenue, Dorchester, Mass.

George O. Linberg, 50 Belmont Avenue, Springfield, Mass.

James R. Emmett, 92 Windsor Road, Waban, Mass.

Ambrose R. Chantler, 364 Potter Avenue, Providence, R. I.

Frank Bromley, Box 128, Apponaug, R. I.

Admitted to Junior Membership—

Woodward Allen, Room 72, 89 State Street, Boston, Mass.

Eric T. Laurin, 40 Lundberg Street, Lowell, Mass.

The Secretary was authorized to immediately send out, in accordance with Article IV of the Constitution, all names of other applicants for membership.

The meeting of the Council was then adjourned.

W. E. Hadley, Secretary.

FORMATION OF NEW YORK SECTION

At the Council meeting of the American Association of Textile Chemists and Colorists held in Boston, January 13, a petition was presented requesting the formation of a New York Local Section.

The petition, reading as follows, was duly signed by thirty-eight members of the Association:

"We, the undersigned Charter Members of the Association, desire to organize a Local Section at New York and hereby request your official approval as required by the Constitution of the Association.

"E. H. Killheffer,	L. C. Lewis,
Chas. F. Schaumann,	Dr. Jos. F. X. Harold,
Giles Low,	A. E. Jury,
Jos. S. Unterweiser,	Thomas D. Ainslie,
W. E. Hadley,	J. H. Culver,
James L. Amsden,	P. F. Kingsbury,
Philip S. Clarkson,	Edward F. L. Lotte,
Frank C. Holden,	E. G. Quin,
H. J. Daignault,	Edward Mayer,
F. Xavier Lehmann,	Frederic Dannerth,
August J. Hunziker,	W. E. Mitchell,
J. M. Matthews,	D. P. Knowland,
Morton H. Wertheim,	Arthur F. Sampson,
Everett H. Hinckley,	S. Donald Perlman,
Herbert Grandage,	Elwood Hendrick,
Percival J. Wood,	R. M. Fischer,
Louis J. Matos,	John F. Warner,
C. A. Mace,	R. Norris Shreve,
W. R. Cathcart,	J. J. Sokolinski."

The petition met with the unanimous approval of the Council, and in accordance with Article XIII of the Constitution the Council proceeded with the election of a Secretary pro tem., E. H. Killheffer, vice-president of the Newport Chemical Works, being chosen for the office. Mr. Killheffer has been granted full power to call a meeting of members and proceed with the formation of such local Section.

The new Section of the Association is to be known as the New York Local Section, but the geographical boundaries of same are to include New York and northern New Jersey.

Attention was called to the fact that, in accordance with Article XV, members living in western Connecticut could affiliate with the New York Section, when formed, in case this proved to be more desirable.

The members of the Council are extremely pleased with the interest manifested by the members in the formation of local Sections, the formation of the New York Section being the third which has already been approved by the Council.

ORGANIZATION MEETING OF NEW YORK LOCAL SECTION

Under date of January 26 the following letter was mailed to all members of the Association living in New York and northern New Jersey. Any members who failed to receive a notice are invited to be present:

Dear Sir—Please be advised that permission has been granted by the Council for the formation of a New York Section of the American Association of Textile Chemists and Colorists, to include principally the State of New York and northern New Jersey.

Will you please arrange to be in attendance at an organization meeting Friday evening, February 3, in Rumford Hall, Chemists' Club, 52 East Forty-first Street, New York City, at 8 o'clock?

Yours very truly,

(Signed) Elvin H. Killheffer,
Secretary Pro Tem.

MERCERIZATION

[*Abstract of an address delivered by Roscoe L. Chase before the Rhode Island Section on December* 30, 1921. *Concluded from issue of January* 16, 1922.]

The speaker quoted from Gardner's "Die Mercerization der Baumwolle" figures showing the amount of shrinkage produced by caustic soda of different strengths at various temperatures. [See table at foot of page.]

Referring to the increased affinity of mercerized cotton for direct dyes, he stated that the increase varies according to the strength of caustic used; also that mercerized cloth which has been subsequently steamed or dried dyes up lighter than cloth not so treated.

The speaker finally took up the subject of "Acid Mercerization," mentioning first Heberlein & Co.'s process (Fr. Pat. 468,821, Oct. 23, 1914) Sulphuric acid of 190 deg. Tw. and above has a gelatinizing and parchmentizing action on cellulose by which its strength is diminished, but below this strength there is practically no action during fifteen minutes. If the cellulose is mercerized first and then the luster destroyed by acid of 103 to 108 deg. Tw. the parchmentizing does not occur and the material becomes softer, denser and similar to wool. The period of treatment varies from a few seconds to several minutes. Phosphoric acid of 123 to 130 deg. Tw., hydrochloric acid of specific gravity 1.19, nitric acid of 85 to 94 deg Tw., zinc chloride of 168 deg. Tw. at 60 to 70 deg. Cent. and a short treatment with ammoniacal cupric oxide bring about the same effect.

Heberlein & Co.'s process for pattern effects on cotton fabrics (Eng. Pat. 13129 of 1914) is as follows: Print concentrated sulphuric acid and wash, or print a resist and follow by treatment with acid and wash. The parts affected by the acid have a transparency. If the goods are first mercerized the effect is more distinctive but acid of over 108 deg Tw. must be used. The parchmentized portions possess greater affinity for dyes.

Edmund Knecht finds that muriatic acid of 34 deg. Tw. has but little effect on the cotton fiber for a short period of time. Muriatic acid of 40 deg Tw. rapidly dissolves cotton at ordinary temperatures and if poured into water yields a precipitate of cellulose (?). If bleached cotton fiber is steeped thirty seconds in muriatic acid of 40 deg. Tw. and then washed, the fiber is badly attacked and becomes tender, harsh and brittle, somewhat similar to sulphuric acid of 140 deg. Tw. Muriatic acid of 36 deg. has no action, but at 37 deg. it not only has a shrinking effect on the cotton yarn but increases its affinity for coloring matters enormously without injuring the feel or tensile strength of the yarn. If successive skeins of cotton are immersed in muriatic acid of 37 deg. Tw., it gradually goes down to 36 deg. Tw. and the mercerizing action ceases. It is figured that the cotton takes up roughly 5 per cent more than would be accounted for by mechanical absorption. Acid of 38 deg. Tw. is even more effective than 37 deg. and the fiber shrinks more and has more affinity for dyes. Acid of 39 deg. Tw. begins to tell on the tensile strength and the yarn acquires a disagreeable harsh feel.

The following amounts of Benzopurpurine 4B were absorbed in a bath containing an excess of color (the estimations were done on the fiber by means of titanous chloride):

Untreated cotton	1.01% dye
Treated with HCl 38° Tw. wet	3.20% dye
Treated with HCl 38° Tw. dry	2.62% dye
Treated with HCl 37° Tw. wet	2.11% dye
Treated with HCl 37° Tw. dry	1.76% dye

The affinity for other colors, as Chrysophenine, Diamine Blue and Black, is also very marked. But towards sulphur colors and indigo the increased affinity is not so great. Strange to say, there is no increase in the affinity for tannic acid. Also for basic colors the treated cotton shows, if anything, a decreased affinity. The shrinkage noted was 4 per cent for the 37 deg and 8 per cent for the 38 deg. A certain amount of curling of the fiber took place so that the dry skeins had to be well stretched before measuring. Two-ply Egyptian cotton treated at 38 deg. Tw. under tension did not produce luster.

NOTICE OF MEETINGS

The next meeting of the Council will be held Friday, February 10, 1922, at the Engineers' Club, Boston, Mass., at 4 p. m.

A meeting of the Research Committee will be held at the same place at 4.30 p. m. of the same day.

Members wishing to bring any matters to the attention of these meetings will please communicate with either the President or the Secretary.

	35.6° F.	64.4° F.	86° F.	176° F.
At 23.2° Tw. the contraction was	12.2%	8.0%	4.6%	3.5%
At 42.0° Tw. the contraction was	19.2	19.8	19.0	13.4
At 52.3° Tw. the contraction was	22.7	22.5	19.8	15.5
At 64.0° Tw. the contraction was	23.5	23.5	20.7	15.0

(The above figures are for one minute exposure)

SECOND RESEARCH COMMITTEE MEETING

The second meeting of the Research Committee was held Friday, January 13, at 4.30 p. m., at the Engineers' Club, the following members being present: Council, with exception of E. C. Bertolet and William D. Livermore, the latter being in New York attending meeting of Dye Advisory Board of Textile Alliance, Inc., as representative of American Association of Textile Chemists and Colorists. R. E. Rose and W. J. Murray were also present. E. F. L. Lotte and W. R. Moorhouse were unable to attend.

Considerable time was spent discussing the reprint of the "Second Open Conference of the Fastness Commission of the Section of the Chemistry of Dyeing and the Textile Industry of the German Chemical Society," same being a copy of a translation which had been furnished by a member of the Council.

It was felt that the entire subject of fastness was so extensive and had so many ramifications that it was only by taking one type of fastness at a time and disposing of that, provisionally at least, that any real progress could be made.

It was decided that two distinct phases of fastness requirements exist: first, the fastness as a specific property of dyestuffs themselves; and, secondly, the fastness required upon the type of dyed fabric under consideration.

In the matter of fixing standards of fastness for fabrics, it was pointed out that different standards must necessarily exist for different types of material such as cotton, flannel, woolen, worsted, etc. Also it was mentioned that madras shirtings would require a different standard than ginghams.

It was pointed out that whereas the chemist and dyer must know what types of dyestuff to employ in each particular case to give the desired fastness upon a fabric, the only phase which need necessarily interest the merchant or the consumer would be the ultimate fastness of the colors upon the finished fabric.

It was decided to confine the attention of the committee to the subject of fastness to washing, for the time being.

The opinion was expressed that boiling in soap is a more vigorous treatment than the average colored wash, which might include the cheaper ginghams, usually receives in the ordinary household washing. That the change produced by the first washing of finished goods is not, in some cases, a fair indication of fastness to washing, owing to the removal of sizes or other finishing materials and some loosely adherent dyestuffs, such as indigo and some of the other vat and sulphur dyes which the washing of the usual finishing processes does not remove.

The Association is interested both as chemists and as manufacturers, and must therefore consider two phases of fastness: that of the fastness of dyes, and also fastness of dyed fabrics.

Manufacturers are selling materials to garment manufacturers, and the latter should be able to establish the fastness by reliable acknowledged methods before they cut up the material.

Attention was called to the fact that the opinion had been expressed by a number of manufacturers, not members of the Association, that a decided prestige would accrue to the Association if we could define fastness tests for dyestuffs and finished fabrics and have them accepted as official.

It was decided that it would be absolutely necessary that we have different grades of fastness for different types of fabrics such as cotton, wool, silk, etc.

It was mentioned (1) that the dyestuff manufacturers were primarily interested in the fastness of dyes; (2) that the selling house was interested in the fastness of the colors upon the fabric; (3) that the manufacturer and textile chemist were interested from both points of view and must choose dyestuffs which possess not only satisfactory fastness as such, but which must yield satisfactory fastness upon the fabric under consideration.

It was decided that, in the fastness tests, type colors must be designated in every instance to make the method of the greatest value. Also, that a good grade of neutral soap must be used and that the strength be based upon the dry soap.

It was voted that a subcommittee should be chosen to represent cotton, wool and silk fabrics.

It was the opinion of the Council that more would be accomplished by confining our efforts temporarily to washing of cotton, and as the different steps were satisfactorily determined proceed to the next.

It was decided to first formulate provisional methods which could be published, and after a reasonable length of time had elapsed, giving opportunity for criticism, they could finally be adopted as official.

Such a method should be accomplished by the statement that the proposed method is to be employed only *on the type of fabric designated*, and not upon any other fabric.

When dealing with type colors, both American and foreign, these should be designated by name, together with the Schultz number, as well as the Color Index number, as soon as that is available.

Type dyes only should be used the chemical composition of which is known, and these dyes should be specific compounds and not mixtures. Such dyes as Primuline, Benzo Purpurine and Immedial Indone R could be considered as specific substances.

(*To be concluded.*)

AMERICAN
DYESTUFF REPORTER

Devoted to the use and application of dyestuffs and the mechanical equipment incidental thereto.

LOUIS A. OLNEY
PROFESSOR OF CHEMISTRY AND DYEING, LOWELL TEXTILE SCHOOL
Advisory Editor

LAURANCE T. CLARK
Managing Editor

Published biweekly by

HOWES PUBLISHING CO., INC.
4109 Woolworth Building, New York City

A. P. HOWES, *President* E. S. PREDMORE, *Secretary*

Subscription price $5.00 per year: Canadian $5.50; foreign $6.00.

Vol. X January 30, 1922 No. 3

IN RETROSPECT—AND PROSPECT

IF all motion is relative, as physicists from Newton to Einstein have assured us, then one need have little hesitancy in asserting that the American dye industry has made most encouraging progress during the past year. But the employment of the qualifying phrase is made necessary, it is believed, by reason of the rather strong current of legislative and other difficulties which has continued to flow dead against it; so as to demand that any reference to this progress, in order to give it its due, be made in terms of relative, instead of absolute, motion forward. In other words, the industry has been in the position of the man rowing upstream who makes a certain speed as measured by the water, and a lesser speed as measured by the banks. If the current becomes too swift, he may actually lose ground while traveling forward. That the American dye industry should have made any progress at all is an eloquent reminder of its inherent vigor, and a very real tribute to the American chemist.

As to the present legislative situation, this has time and again received a thorough airing, and there is little to be added. It has been characterized principally by paralyzing inaction which has produced a state of uncertainty detrimental to the interests of both manufacturers and consumers of dyestuffs. Both recognize the need for definite legislation of some sort, but since this seems to be almost as far away as ever after nearly three years of discussion, the best that can be done is to bear the present highly unsatisfactory state of things with fortitude. Thousands of words of editorials have been printed by our daily press throughout the country, and some of these contributions have shown a woeful lack of knowledge of the fundamentals of the problem, which has not helped matters. Lack of general information on the part of the public continues to be one of the serious obstacles. Many schemes for protecting the dye industry and, simultaneously, safeguarding the interests of consumers, have been suggested, yet up to the present the most logical appears to be the plan embodied in the pending Fordney permanent tariff. This, while not by any means perfect, has fewer objections than other plans, and there is little doubt but that it could be administered in a manner satisfactory to all interests.

The development of new colors has been encouraging and pleasantly indicative of the abilities of our technical men. This, however, cannot be prolonged indefinitely under the conditions which now exist, for the reason that the vast amount of research required is expensive, and to meet these expenses the dye manufacturers have in many cases been obliged to draw upon their reserve funds. This is one of the results of the ruinous competition which has sprung up.

The latter is one of the most important of the evils with which the industry is at present contending. It is also an effective answer to the oft-repeated charge that protection of the industry will bring about an American dye monopoly. The industry is at present protected by the licensing system, administered by the U. S. Treasury Department, and under this system it receives rather more in the way of protection than is contemplated by the Fordney tariff. Notwithstanding this fact, American dye manufacturers are at present competing with each other in the matter of prices for identical products to a degree which cannot be maintained. If efficiently conducted, the investigation of the industry which is just now getting under way as a result of the King resolution should not fail to show this.

An instance or two will serve to make this condition clear. In one case an agent for a manufacturer was selling a product to a consumer at $1.50 a pound. This was regarded as a fair price by the consumer, who made no objection whatever to paying it, and was thoroughly satisfied with the product. The seller was making a small profit at that price.

Presently another agent made a bid for this business, offering the same product of the same factory. When told it was already being used, at a price of $1.50, he offered it for $1 a pound, sacrificing the profit to get the business. Shortly afterward, a third agent offered the identical product of the same factory at 65 cents a pound. Now none of these agents is making any money and the consumer himself is receiving no permanent benefit because this price cannot be maintained.

Again, there is an authenticated instance where two concerns, whom we will call "A" and "B," were each making a color greatly in demand by the cotton industry. These two were, moreover, the only American manufacturers of this product. "A" was supplying it to a large print works at $4 per pound—a price which just about covered his costs. In an effort to get this business, "B" offered the product at $2 per pound—a price which meant a large loss on every pound sold. Being advised by the print works of "B's" offer, "A" felt compelled to meet the lower price and, his product being slightly superior, continued to get the business. In other words, the only result produced by "B's" foolish tactics was to

compell his competitor to sell his goods at a loss. And, again in this instance, there is no permanent benefit to the consumer, as neither concern can long maintain this profitless selling.

This is the "monopoly" feared by Senator King and others!

Another bar to more rapid progress is believed to be the fact that the American industry, unlike the German, does not, as a general rule, possess technical men as executives. The heads of the Interessen Gemeinschaft are recruited from men who have received an exhaustive schooling in th laboratory and in the plant, and who, in addition, are also gifted with executive and business ability—a combination of qualities hard to obtain and which only results from the early setting up of exacting requirements for leadership. The business ability of our own dye manufacturers' executives is unquestioned, but their early schooling has been, in many cases, rather along the lines of finance than organic chemistry. A complete understanding of both is necessary to secure such results as Germany achieved, and in view of the impending competition from that quarter, the very best we can offer will not be too good.

We have already brought over a number of German color chemists to help us save some of the additional time for research which would otherwise be required for the development of new colors, and it would seem as though we might profitably borrow yet another idea from Germany by duplicating her employment of technically trained executives.

It is only such as these that can instantly detect a weakness and remedy it before much damage is done, and it is likewise only such as these that can realize to the fullest extent the potentialities of the industry, and so build for the future day by day.

"WHERE THERE'S A WILL—"

SOMETHING like a year or so ago there was begun, in the vicinity of New York City and perhaps elsewhere, an advertising campaign for the introduction and exploitation of a new toilet preparation. This campaign, which at best was never a very pretentious one as such things go, and which was carried on principally in the subways and surface cars of New York, and in the suburban trolleys, of late has appeared to languish. Nevertheless, it did contain one exceptional feature, a hackneyed, shop-worn phrase, used hundreds of times before by hundreds of advertisers and glanced at uncomprehendingly, because of its sheer triteness, by thousands of readers—a phrase which had become, indeed, through long usage, so familiar that it had ceased to convey any meaning whatever. Yet by the clever use of italics in such a manner as to place the emphasis in a new and totally unexpected place, and by an equally clever arrangement of type matter so as to give it more prominence without unduly increasing its size, this verbal relic was metamorphosed into a thing of almost superb power. Some readers may recall having seen it, but this is doubtful. However, at the bottom of every car-card and poster it regularly appeared during the early months of the campaign, thus:

"Your dealer can *get* it!"

Now, it is held by some that there are reasons why this particular handling of this particular phrase in its application to the particular product referred to is worthy to rank as an advertising achievement somewhere near the classic You-press-the-button-we-do-the-rest which made a fortune for the Eastman Kodak Company. We should like nothing better than to advance these reasons and to discuss them, for they are highly interesting. But we cannot do so here. The point is that the American dye industry possesses, ready at hand and waiting to be employed, the very slogan or phrase best calculated, it would seem, to deliver its most important message to the public and to clear away more misunderstanding than all the painstaking, carefully worded magazine articles put together.

Is there no dye capable of giving satisfactory results on such and such a fabric?

There is.

Your dyer can *get* it.

Your dyer *can* get it!

And the chances are strong that he can get it from an American dye manufacturer, if you refuse to accept excuses and thus make him want it badly enough. As long as you permit him to foist cheap work upon you on the pretext that nothing better is obtainable, he will continue to do so—and pocket the difference.

Think this over: The consumer is king. What he persistently demands, some one will supply. And it will be supplied at a fair price, too. No group can establish a monopoly of a manufactured article in this country and consistently hold the price up beyond that point which permits a reasonable profit. Particularly is this true in the manufacture of articles depending upon science for their existence, such as coal-tar colors. There are too many alert, scientific minds, and too many separate groups of men with unlimited capital ready to be shown the way to a quick fortune by undermining—or underselling—already established groups in various lines. The thing has happened over and over again, and is so self-evident that it is puerile to talk of a dye monopoly here under any circumstances, embargo or no embargo.

We believe most of our scientific readers will agree with us when we say that if every chemist and chemical engineer in the country, under the stress of sudden, dire need, were, collectively, this week to begin giving their undivided attention and efforts to the problem, in the course of a week, or a month, or a year, some way would be devised of manufacturing sulphuric acid yet more cheaply. It might come from the most unlikely source, and in the most unlikely way. But surely no man of scientific training would be so rash as to say that the last word has been reached. No man could say with authority that it had been reached even if the cost of manufac-

ture were to-morrow reduced to one-tenth of its present amount.

Therefore, we may accept as fully demonstrated the proposition that a concerted, unyielding demand on the part of the public for first-quality colors, without any material increase in the cost of apparel dyed with these colors, would be met by some one, somewhere. Further, it may be accepted as a fact that it would be met by Americans.

The reason why it is not being met more generally today is because such a demand does not exist. A *wish* exists, but not a *demand*. The reason why no demand exists is because the public, as a whole, is not aware that it has the *right* to make such a demand.

The people of the United States have been misled into thinking that they are fortunate in getting even such unsatisfactory results as they frequently do get from garments colored with American dyes. The fact of the matter is that the dye manufacturers, who are perfectly capable of giving the public what it has a right to demand, have received from garment manufacturers very little real encouragement to put forth their best efforts. Only the public can remedy this condition, and hence it would seem that the dye industry would do well to "turn informer" and let the public know all about those who have been at so much pains to suppress the truth concerning their capabilities.

There is not the shadow of an excuse for obviously inferior dyeings on goods purchased for a fair price from otherwise reliable dealers with established reputations. More often than not the fault lies somewhere back of the dealer himself, but in nine cases out of ten it stops short of the dye manufacturer.

To repeat: The dyer can *get* it! By "the dyer" we do not mean the individual who applies the dye to the goods, but the head of the establishment which employs him or the firm which orders him to dye "at a price." If the latter cannot get it from an American manufacturer, he can get it from a German, or a Swiss. He is not denied this privilege, even under the present defective system of protection, and if he declares that the Treasury Department will not permit him to exercise it, you may depend upon it that he *can* get what he needs somewhere in America—and the Treasury Department can tell him where. Further, if he can show that the Treasury Department is wrong, which should not be difficult, assuming that a mistake really has been made, he will be granted permission to send abroad at once.

We are not certain as to just how far the use of slang will be condoned by readers of these columns, but we shall at least risk the declaration that if the dye makers will strongly emphasize the point that the dyer can *get* it, we are sure that the public will "get" it, and act accordingly.

A CONSTRUCTIVE CONTRIBUTION TO THE DYE LEGISLATION CONTROVERSY

THROUGHOUT the thirty-two months since the effort to stabilize dye import legislation began—and even before that—the minds of those concerned with this problem have not been concentrated merely on the creation of a plan whereby manufacturer and consumer should alike be protected, which by no means presents difficulties requiring nearly three years to eliminate. What has been sought as a necessity is a plan that would accomplish these things without presenting features which could be made into political issues by enemies of the industry. It is this which has proved to be the almost insurmountable obstacle.

Back in 1919, nearly everybody had a scheme for the salvation of the industry and the propitiation of Congress. Subsequently, when much of the general sentiment had crystallized in favor of the licensing system, and this was being urged by Representative Longworth, ideas were still fairly numerous. But with the advent of the present limited embargo proposal the erstwhile flood of amateur legislators rapidly subsided, and there ensued a drouth.

It is with real interest, therefore, that The REPORTER receives from an American dye manufacturer the first sane and really constructive suggestion for a solution of the problem which has come our way in months. The author of it makes plain his desire that it be regarded as tentative only, and seeks other opinions as to its feasibility. It displays every evidence of careful thought and a most intimate familiarity with the usual objections raised by opposers of dye protection; and hence, because it forms a highly interesting subject for speculation as to the possible treatment it would receive in Washington, and because we believe in giving the widest possible circulation to every contribution to general thought upon this subject, we herewith present it for the consideration of readers.

This plan would give to the dyestuff industry protection in the form of such ad valorem and specific duty rates as might be determined upon, coupled with the usual provisions against dumping.

But it would add a special stipulation, however, to the effect that if at the end of any fiscal year the President should find that more than twenty-five per cent of the total dyestuff requirements of the counry, for all purposes, had been imported, he would then be empowered to prohibit by proclamation the importation of foreign dyes except subject to licenses granted by the Tariff Commission. We quote:

"These licenses shall only be granted for such dyes as are not made in this country, and for which no substitute made in this country having the same chemical composition or characteristics can be employed. This prohibition shall continue until such time as the price of the domestic product may be increased until it is twenty-five per cent higher than prevailed at the time of the proclamation."

That the American dye industry would not be wiped

out by unrestricted—save for the duties noted—competition up to twenty-five per cent of the country's total requirements for all purposes, we may accept, for the sake of argument, without question, since the proposer is himself a manufacturer. Granting this, then, one must take account of the fact that under such a law there would almost certainly be two classes of colors imported, i. e., some not obtainable here, and some already being made here. There must also be taken into consideration the fact that under such duties as Congress would consent to impose, the Germans could and would undersell our manufacturers on any imported product coming into direct competition with an identical domestic product.

The question now becomes one of whether those who preferred sending to Germany for colors already obtainable here, because of lower prices or other reasons, would absorb a large enough portion of the stipulated twenty-five per cent of the total requirements to force others, seeking unobtainable products, to swell the total to a point above the twenty-five per cent for the year. Evidently our correspondent believes not, but there may be some who would disagree with him in this, or at least regard such confidence as based upon mere speculation rather than demonstrable fact. On first view there would appear to be many reasons why a Presidential proclamation at the end of the first year might be considered as inevitable; yet on looking deeper into the possibilities it is extremely interesting to reflect that the Germans might logically be expected to work against this, even to the extent of refusal to sell any more dyestuff tonnage than just enough to keep inside the limit, since their total sales under this system would be greater than would be the case under the licensing ban which would immediately be imposed. Carrying this idea still further, there is the question of imports from Switzerland and England, which would further cut down Germany's total of possible sales and make it difficult for her to calculate her exports so as not to overshoot the mark, yet at the same time send us the maximum amount allowed by the limit. Finally, it must be remembered that American consumers themselves would in all likelihood take a hand and agree to prevent a return of licensing by refusal to purchase more than twenty-five per cent of their requirements abroad per year.

There are many other angles from which this plan might be developed, and all are interesting. But suffice it to say for the present that it appears to be an ingenious and well-balanced scheme for accomplishing the purposes in mind.

Moreover, there is nothing in it to which Congress could take serious exception. It is extremely liberal in its treatment of consumers, and frees them completely from all forms of harassing red tape. There is no such word as "embargo" for the free-traders to make a target of, and the possibility of the actual application of the licensing system can be shown to be rather remote.

The "monopoly" objection disappears utterly, and not event Senator King himself could put together any kind of an argument on this score. A monopoly could scarcely exist while nearly a quarter of our domestic requirements were being imported from abroad. On the other hand, it gives adequate protection, since, should importations become so heavy as seriously to imperil the life of the American dye industry, on would go the licensing system. Then, should our dye makers attempt to take advantage of this to raise prices, away would go their protection again.

In short, the very best feature of this plan is the promise it holds out of freedom from hampering regulation of any sort, since all three factors—American dye manufacturers, American consumers and German dye manufacturers—could only injure themselves by excesses of any kind, and hence would logically become self-regulating.

An amendment which The Reporter feels would improve the suggested measure somewhat would make the final paragraph read: "This prohibition shall continue until such time as the price of the domestic product may be increased until it is twenty-five per cent higher than prevailed at the time of the issuing of the proclamation, *or until one year from the time of the issuing of the proclamation.*" As the plan stood before, licensing of a given product, once imposed, would continue indefinitely as long as American manufacturers did not exceed the twenty-five per cent limit for increase in price, which proceeding would, no doubt, be objected to by consumers. Nevertheless, this is another contingency so remote as scarcely to be worthy of notice, since no manufacturer would deliberately raise the price of a product to a point where he knew it would result in taking his market away from him.

It would be interesting to hear a Congressional debate on such a measure as this. Stranger things have happened, and should Congress again fail to agree on the Longworth proposal, it is at least certain that something else will be tried. Meanwhile, we should be glad to hear the views of readers.

Dr. Herty's Jersey City Address—A Denial and a Reply

DENIAL of certain statements attributed to "an American chemist on a visit to Germany" in a letter read by Dr. Charles H. Herty, President of the Synthetic Chemical Manufacturers' Association of the United States, during the course of a recent address before the Chamber of Commerce of Jersey City, N. J., has been made in a communication to The Reporter from Dr. Nicolas Ernster, who declares that the American chemist in question was himself, but that the letter purporting to quote his statements was inaccurate.

In the interest of accuracy, therefore, Dr. Ernster's communication was forwarded to Dr. Herty. Both Dr. Ernster's denial and Dr. Herty's reply are here given.

The passage referred to, as readers may recall, ap-

peared in The Reporter of December 12, under the general heading, "Germany Holds Fast to Pre-War Trade Methods." This article gave extracts from Dr. Herty's Jersey City address during the course of which he read the report of the German Commercial Attache in Rome to his chief in Berlin, recommending the fomentation of Italian discontent in order to break down the legislative barriers against German dyes and chemicals.

The article in question concluded with some paragraphs under the subheading, "German Spying System," and stated that "another interesting point brought out by Dr. Herty in his address was the fact that, just as Germany had perfected a remarkable system of sabotage during the war, so has she built up a spying system in the industrial war which she is now waging. To illustrate this point, Dr. Herty quoted from a letter which he received November 23 regarding the experiences of an American chemist in Germany. This correspondence follows:

" 'Dr. ———, who is with the ——— Company, has just returned from a trip to Europe, where he went at the request of his employers, as I understand it.

" 'He saw quite a few people, and among them Dr. Von Weinberg, whom you know; and Dr. Seebohm, formerly of the Bayer Company and now with Griesheim Elektron.

" 'In conversation with Dr. Von Weinberg, this gentleman remarked that he knew exactly what the National Aniline & Chemical Company plants had cost, and, if an embargo were put on dyes, they would immediately begin to build and they would build a plant for just one-tenth of what it had cost the manufacturers to build their plants here, and also spoke of their experience, which would naturally be of great use to them.

" 'Dr. Seebohm, who, you know, is a brother-in-law of Duisberg, very much astonished Dr. ——— by telling him their (the ——— Company's) yield in August was only so much on certain dyes, where it was higher the month previous; and admitted he had data of the yields and productions of all the dyestuff manufacturers of this country.' "

It was the passage quoted above which drew forth the following letter from Dr. Ernster:

North Billerica, Mass.,
January 5, 1922.

To the Editor of The Reporter:

In your edition of December 12, 1921, you published a report of Dr. Herty's address before the Chamber of Commerce of Jersey City, entitled "Germany Holds Fast to Pre-War Trade Methods." The last chapter of this report describes the "German Spying System," and is supposedly based on the report of an American chemist, Dr. ——— (no name given), about his experiences in Germany.

To my great surprise I found that I was the chemist in question. Admitting this to be true, I would like to make a few corrections to Dr. Herty's report. The information was apparently given to him by a young manufacturer in New York who was quite a bit upset by a talk I had with him about Germany—that is, her conditions, and especially the state of her chemical industry.

Now for the facts. I did not have any business talk at all with Dr. Von Weinberg, but with his representative, Dr. F———, and later with Mr. Seebohm. I must confess that both gentlemen talked very sensibly, and, as can be easily understood, were rather reticent about American conditions. Dr. Von Weinberg, for a good reason, stated above, did not make any of the remarks referred to by Dr. Herty; and as to Mr. Seebohm's supposed remark about the monthly output of the plant where the writer is employed, it is rather silly, considering that the plant was not in operation for months before the date mentioned.

The talk that the writer had with Dr. Herty's informant about the German chemical industries, the low cost of German manufacture, comparative market prices, etc., left the latter more or less perplexed. Some—I say some—of the remarks which he attributes to the two German business men were merely personal arguments of the writer in a discussion that arose about the conditions in the two countries.

It is rather surprising to me that Dr. Herty made such strange assertions on mere hearsay, and did not try to get first-hand information.

In the hope that your esteemed paper will print these few lines for the sake of truth, I remain, etc.

[Signed] Dr. Nicolas Ernster.

To which Dr. Herty makes the following reply:

[Letterhead of the Synthetic Organic Chemical Manufacturers' Association of the United States]

To the Editor of The Reporter:

I appreciate your courtesy in forwarding me for reply a copy of a communication from Dr. Nicolas Ernster.

I did not give names in the course of my Jersey City address, as I had been requested not to do so.

The only reply I desire to make to this communication is a request that you print the attached material, which I think speaks sufficiently strongly on the point, adding only that it is interesting to note how readily Dr. Ernster recognizes himself as the one quoted, though he denies making any such statements.

Chas. H. Herty,
President.

The letter attached to Dr. Herty's reply follows:

[Letterhead of Zinsser & Co.,
Hastings-on-Hudson, N. Y.]

To Dr. Charles H. Herty:

Your communication enclosing copy of a letter from Dr. Ernster to the American Dyestuff Reporter is just received.

I dislike very much getting into a discussion with the Doctor, but as he questions the truthfulness of the statements made to you, I wish to repeat again the conversation he had with my son, the head of our dye sales organization, and a third person.

Dr. Ernster did state that the German manufacturers, among whom he mentioned Mr. Seebohm, had complete records of the activities, yields and methods of the American dyestuff and chemical plants. In this connection he mentioned that the person with whom he spoke took from his files a paper from which he read the details.

He furthermore stated that his informant told him that, in case of an embargo, the Germans would at once begin to build, and that they knew the exact cost of the plants in this country and could duplicate them at a small fraction of their original cost. This information was given as coming either from Von Weinberg or one of his assistants.

The Doctor, furthermore, wrote to our Sales Manager during Christmas week, sending him the season's greetings; and one of the paragraphs in this letter is as follows:

> "I was surprised and amused to read in the AMERICAN DYESTUFF REPORTER of December 12 of a report by Dr. Herty on the German spy system.
>
> "I should be interested to know if Dr. Zinsser sent that letter to Dr. Herty, and why he was afraid to use my name. If that was the case, I might have given him a lot of additional information."

I do not know what caused this recent change of heart on the part of Dr. Ernster.

The fact that my understanding of this whole conversation is correct is attested to by the signatures hereto attached.

[Signed] F. G. ZINSSER.

We have read the above statement and hereby affirm that it is substantially correct in all its details.

[Signed] J. S. ZINSSER.
F. X. LEHMANN.

DYEING AND PRINTING OF FOULARDS

(*Continued from page* 84.)

they stain the whites but little, if at all. As most patterns printed on foulards have delicate outlines, the color mixer should make a proper selection of the thickener to be used, the best being gum senegal used alone or in combination with Dextrine (white) or British gum (brown or canary). Various patented or proprietary thickening agents are brought out from time to time, claimed to possess special value for certain kinds of work, but a skilled color mixer can always, in conjunction with the printer, decide upon the proper mixture of ordinary commercial thickeners to use or make up.

The following working formula will be of interest:

	Parts
Color	½ to 3
Water	45½ to 39
Phosphate of soda	1 to 3
Glycerine	3 to 5
Gum solution (thickeners)	1:1 to 50

These are compounded by dissolving the color in the water, at the same time putting in the phosphate of soda and glycerine. Stir well, with the aid of heat, and when solution is complete pour into the thickener and continue stirring, first with heat and continually as it cools off.

COLORS AVAILABLE

The colors generally available for this work follow:

Yellows—Thioflavine S, Diamine Yellow CP, Diamine Fast Yellows A and FF.

Pinks—Direct Rose T, Diamine Rose.

Scarlets—Oxy Diamine Red S, Diamine Purpurines, Diamine Scarlets B and 3B.

Dark Reds and Clarets—Diamine Fast Red F, Diamine Bordeaux S, Diamine Brilliant Bordeaux R, Diamine Brilliant Scarlet S.

Violet—Diamine Violet N, Diamine Fast Violet FFBN and FFRN.

Bright Blues—Diamine Sky Blues, Diamine Pure Blue A.

Navy Blue—Diamine Blues 2B, 3B, 3R, RW, Diamine Steel Blue L.

Greens—Diamine Greens B, G, etc.

Browns—Diamine Browns 3G, B, MR, Cotton Brown A, Oxy Diamine Browns 3GN, RN, Diamine Catechines G, 3G, B, Diamine Fast Browns G and R.

Grays—Diaminogene Extra, Diamine Dark Blue B, Diamine Fast Gray BN.

After printing, the foulard is hung to dry; but drying should not be retarded nor forced too rapidly, nor too sharply—that is, the printed cloth should not be made "bone dry." Steam for about three-quarters of an hour, seldom over one hour, in a cottage steamer, giving a pressure of from 3 to 3½ pounds.

If steaming without pressure is resorted to, there is always a possibility of moist steam, with the liability of some of the colors running into whites.

After steaming, wash the fabric with cold water in a broad washer, and afterwards brighten by giving a passage through a weak acetic acid sour, then whiz and dry.

Discharge effects produced upon plain colored grounds require that the foulard be dyed perfectly level, which requires that all the conditions above noticed should be given close attention.

The dyeing is done preferably in large wooden dye tubs, the cloth being worked slowly over a winch, and adding further quantities of colors from time to time until the correct tone and depth are obtained.

The choice of colors for this kind of work is limited to such as go on the goods slowly and evenly, and which are capable of complete discharge with Hydraldite, leaving a clean white for the figure.

Dyeing

Dyeing is carried out in the following manner:

The dye bath is prepared with 4 per cent of acetic acid and the proper quantity of color, which must be first completely dissolved and added to the bath through a fine sieve; this prevents the possibility of undissolved particles of dye spotting the goods.

The goods are entered at a temperature of 200 deg. Fahr. and dyeing continued at this temperature for half an hour; then add in several portions about 4 per cent more of acetic acid, and work for half an hour longer without any increase of heat.

Some special colors require an addition of 2 to 4 per cent of sulphuric acid instead of acetic acid.

After dyeing, lift, rinse well and dry without brightening.

Blacks are produced on silk fabrics most commonly by the so-called diazotizing and developing process, which is as follows: After dyeing as above with Oxy Diaminogene, Diaminogene or Diamine Black BH, rinse well and work for one-quarter of an hour in a cold bath containing:

	Per Cent
Nitrate of soda	3
Muriatic acid	9

Rinse and at once, in a ready prepared bath, develop and fix the color by working from one-quarter to one-half hour cold; then rinse, pass through a hot soap bath, and brighten.

The developing bath is prepared by dissolving 1 per cent beta-naphthol (of weight of the goods) in an equal weight of caustic soda lye 75 deg. Tw., or ¾ per cent Phenylene Diamine in ¼ per cent soda ash.

After the dyed goods have been made ready for discharging they are batched and put on the machine.

For white discharge the following "color" is used:

	Parts
Hydraldite CW Extra	250
Gum water 1:1	750

Heat to 160 deg. Fahr. for one-half hour and stir until cold, and then force through a fine sieve or grind in a ball mill.

After printing on the discharge, dry the cloth lightly, but do not leave it moist, and pass through hot steam for a few minutes, keeping the temperature in the steamer at 211 deg. Fahr., or close to that point.

After steaming, pass for eight minutes through a cold sour made by adding ½ ounce of muriatic acid per gallon of water, finally rinse, and brighten with acetic acid as for direct prints.

Colored discharges are easily produced by using a formula based on the following one from practice:

	Parts
Color	2 to 5
Water	48 to 55
British gum	250
Hydraldite CW Extra	150

The dyes chiefly used for colored discharge work are basic in character, and are selected on account of the brilliancy and life they give to the finished foulards, especially when applied to blacks, deep blues and deep browns.—"Posselt's Textile Journal."

Sir William Alexander Declares Co-operation of All Factors Is Only Means for Defeat of German Dyestuff Aims

Makes Plea to British for "Empire Policy" in Dealing with International Situation—Manufacturers, Consumers, Chemists, Labor and Government Must Work Together—Deplores Use of Printing Presses to Raise Credits

THROUGH the courtesy of "The Chemical Age," of London, and at the request of the author, The Reporter is privileged to present in this issue the latest words of Brigadier-General Sir William Alexander, Chairman of British Dyestuffs Corporation, Ltd., and Managing Director of Charles Tennant & Co., of Glasgow, regarding the international dyestuff situation.

Readers will remember that while Sir William was visiting this country last fall he gave to this publication an interview in which he discussed international conditions, which appeared in the issue of October 24; and which, because of its authoritative source, and its sane, logical grasp of the world situation, at once attracted considerable attention in the American industry. In that interview the British manufacturer dealt more particularly with the problem of America in relation to the international field, while in the present one, published in "The Chemical Age," he is addressing his fellow countrymen. Nevertheless, his words should be of extreme interest to Americans because of the similarity between the dye problems of the two nations.

Sir William enters a strong plea for an Empire policy for the development of the British dyestuffs industry, which was greatly enlarged for war purposes. Great Britain itself, he states, has facilities for supplying at least the entire requirements of the British Empire, and he sees no reason why British manufacturers should not have this trade.

He estimates that as a result of war expenditures the various capacities for dyestuffs production in existence to-day could turn out a total of 86,000 tons per annum, exclusive of Germany, whose pre-war trade was 135,000 tons, and whose capacity is now much greater.

While admitting that, in the past, concentrated effort on the part of Germany has left England behind, he denies emphatically that Germany possesses better scientists, chemists, engineers or wage-earners than England does. The new and extensive British dye works, capable of employing large numbers of men, cannot be allowed to become derelict, either in the interests of national security or in the interests of the commercial prosperity of the Empire.

Sir William is confident that England will be able to maintain these plants in operation for the benefit of the nation if certain recommendations which he makes are complied with. These call for co-operation on the part of consumers, chemists and engineers, labor, and the Government; they are logical and necessary if the desired results are to be achieved, and might well be applied with equal force on this side of the water. They will be found in the complete statement hereafter.

Referring to the reconstruction of European trade, Sir William points out that the employment of printing presses on the production of paper notes is a disastrous means of raising credit, and one which must inevitably lead to commercial chaos and bankruptcy, and condemns export credits and other schemes introduced for the establishment of trade on long-deferred credit as only leading to encouragement to European countries to rush into debt for goods they cannot pay for. He states in conclusion that a trade recovery must be gradual if the best interests are to be served, but that unless it can have cheap coal and cheaper transport, British industrial development will be materially retarded.

His statement, in full, follows:

"Few, if any, of those occupied in the control and administration of industrial concerns will shed tears over the passing of 1921. For manufacturers, especially, committed to heavy overhead charges and running expenses, and responsible for the employment of masses of wage-earners, it has been a year of apprehension and anxiety. Following on a short post-war boom of exceedingly speculative trade and production, stimulated by overconfidence, extravagance and artificial credits beyond the limits of sound finance, the first whisper in the autumn of 1920 of insolvency on the part of nations and firms accelerated the rapid development of financial mistrust, commercial stagnation and all the evils which automatically follow in such a trail.

"The year 1922 opens with little more tangible than the pious hope of a change for the better, but it is to be expected that the drastic medicine administered under the force of critical circumstances will shortly effect a slow but sure cure, even in spite of the prevailing world adverse economic conditions.

"Money which should to-day be employed in industry is accumulating in vast sums on deposit in the banks, a very unhealthy sign, and will not be rectified until confidence is restored.

Industrial Chemicals and Dyestuffs

"Chemicals, to a greater or lesser extent, and at one stage or another, enter into the production of almost every class of manufactured commodities, and for this reason the chemical market has been designated the barometer of general trade. Similarly the demand for dyestuffs gives a good indication of the prosperity or otherwise of that very large and important group of British industries falling under the classification of 'textiles.'

"These two groups, chemicals and dyestuffs, are very closely associated and form two of the most important and valuable key industries which a nation can possess. They ought to be vigorously developed and closely guarded. Their importance was early recognized by Germany, where they are amalgamated and run by that powerful organization the 'Interessen Gemeinschaft,' with a total capital of over 2,000,000,000 marks, nominally £100,000,000. The chemicals and dyestuffs plant of this huge organization proved an asset to Germany in the late war, for propellants, high explosives, poison gases, etc., which was invaluable and gave to her in the critical stages a predominant possession of supplies for which Britain was starving.

"Recently a similar organization has been established in America, combining heavy chemicals, coal-tar products and dyestuffs under the control of 'The Allied Chemical & Dye Corporation,' and a recent visit to America convinced me that there is in America a determined post-war policy—shared alike by producers and consumers—to protect American home industries, especially chemicals and dyestuffs.

Lessons from the Past

"A short review of the past history of British interests in these two groups, with a few suggestions for their future, may be interesting and instructive. Great Britain was largely responsible for the origin, utilization and development of chemicals and dyestuffs for industrial purposes, and the discovery of dyes extraction from coal tar—which revolutionized the art of dyeing—stands to the credit of a British scientist. Although she built up and maintained, in spite of foreign

competition and against protective tariffs abroad, a large and creditable chemical manufacturing industry, Britain utterly failed to realize the prospective value of dye making by following up her own discoveries and developing in practice an industry in which she held an unique advantage as far as raw materials were concerned.

"Consequently, prior to the war Germany had been presented with practically a world monopoly of a very great and profitable industry having a direct trade of about 135,000 tons per annum out of a total world's consumption of about 160,000 tons, and giving direct and indirect employment to hundreds of thousands of persons, and livelihood to probably four times the number. If to these figures are added those employed in the outside German chemical industries the numbers will be very substantially greater.

"Let us now investigate the influence of established German chemical and dyestuffs plant from the moment war was declared. Germany was enabled to switch over from peace-time production chemical plant to the output of propellent components and high explosives, subject only to extensions to meet increased demand, and dyestuffs plant to those new and deadly effective weapons of war included in poison and toxic gases. British chemical plants, fortunately existing, were also promptly adapted to the production of propellants and the older classes of warfare munitions covered by nitrocellulose compounds, while necessary additions and extensions were put in hand.

"Trench warfare, however, soon called for high explosives, such as TNT, picric acid, ammonal, etc., and later for poison gases, and the absence of dyestuff plants in this country and experience in mass production was a serious handicap. No alternative existed but to design and construct plant and train chemists and engineers to deliver the goods from such plants as were erected at Gretna, Queensferry, Huddersfield, Blackley and elsewhere.

"During the construction and equipment of plants in this country it became essential to purchase in America vast quantities of propellants and high explosives at high premiums against credits which drained the country of its gold reserves and negotiable securities. It should be noted, however, that once the country had installed the facilities, the results obtained from the operation of plants—many of them entirely novel—under British chemists and engineers were not surpassed in efficiency by any other nation, Germany included. This fact ought to be borne in mind when we are discussing the maintenance and operation of the plants now existing far peace-time production.

World's Increased Output Capacity

"As in our own case, other countries—notably America, Japan, Italy, France and Germany—find themselves with new or largely extended capacity for chemical and dyestuffs, so that to-day the world's power to consume these commodities is far below the world's capacity to produce, and Great Britain itself has facilities for supplying at least the entire requirements of the British Empire.

"Is there any reason why we should not have this trade? As a result of war expenditure it may be estimated that the following capacities for dyestuffs exist in up-to-date plant: United States, 32,000 tons per annum; Great Britain, 30,000 tons; Switzerland, 12,000 tons; France, 8,000 tons; other countries, 4,000 tons—a total of 86,000 tons per annum, exclusive of Germany, whose pre-war trade was 135,000 tons and whose capacity is now much greater. Although such surplus capacity may mean a peace-time war of elimination, have not these two solvent nations, Great Britain and America, every chance of pulling through when they are uniquely and satisfactorily placed for all the raw materials, if application and determination be added?

"I will admit that in the past concentrated effort on the part of Germany has left us behind, but I have yet to learn that the quality of German brains is superior to those of our own scientists, chemists, engineers and wage-earners. Neither in the interest of national security for the future nor in the interests of the commercial prosperity of the Empire can we allow these new and extended installations, capable of employing so many citizens, to become derelict. We have the power to maintain these plants in operation for the benefit of the nation—

"1. If British Empire consumers will support their own Empire industries in the same sympathetic spirit as shown by Australasia, for example.

"2. If British chemists and engineers responsible for running plants will concentrate with determination towards maximum efficiency.

"3. If British labor will recognize that maximum production per unit of labor or plant is the greatest security for regular and good wages and low cost of living.

"4. If the British Government will continue to assist British industries to fight against depreciated currencies and other handicaps to fair trading on equitable terms.

"5. If the British Government will realize that its consuls and trade commissioners overseas should be competent, commercially, to pioneer, advertise and assist in the development of British trade.

Government Assistance

"Reference to British Government assistance compels one to comment on past efforts and methods. Government acts and forms of legislation should be communicated in definite and simple language and clear to the understanding of those called upon to conform to the provisions. This has not been the practice, and acts are so ambiguous and indefinite in wording that only 'wizards' could be expected to interpret the in-

tentions. Consequently, exasperation, irritation and lengthy litigation are often the immediate result.

"Let us analyze only two typical cases affecting the particular industries under review. The Royal Proclamation of 1919 dealing with the importation of foreign dyestuffs was wrongly drawn, having regard to the law, and its illegal nature having been made clear by the Sankey judgment, this new industry was left for twelve months at the mercy of German dumping to the serious financial prejudice of an industry which the British Government had committed itself to protect. More recently, one follows with regret the numerous and contentious discussions arising out of the nebulous, academic but non-commercial clauses of the Key Industries act involving lengthy and costly arbitration as to what constitutes 'a synthetic organic chemical.'

"Key industries should surely be more simply definable than by meticulous class and scientific descriptions always open to argument. Does not the title indicate as 'Key Industries' those productions for which the country is advantageously placed from the point of view of raw and semi-manufactured materials, for which she possesses the requisite efficient plant and knowledge, and which will employ British labor and yield in return commodities at such prices as will inflict no hardship nor put out of business those who are consumers?

"If we can realize these aspirations there is no reason for despondency as to the future welfare of the chemical and dyestuffs industry, or, in fact, any large industry where good facilities are available.

Reconstruction of Europe

"The trade slump of 1921 has shaken confidence to its foundations. It is to be hoped that a beneficial lesson has been taught as a result of the wild speculation and gambling of 1919-1921, namely, that, however great the demand, profitable and successful trading can only be conducted proportionately to the amount of cash or sound credit available. Printing presses, working overtime on paper notes, are to stave off liquidation, a disastrous method of raising credit, and sooner or later lead to commercial chaos and bankruptcy.

"The reconstruction of Europe—many of whose nations were our largest customers in pre-war days—is all important to Great Britain as an exporting nation, and no opportunity on the part of such solvent countries as Great Britain and America to assist in reconstruction on sound lines to the extent of such finance as can be safely extended should be missed, but the greatest and most enduring assistance will be in the direction of encouraging poor nations to help themselves. Nations whose currencies have fallen so low as to have little or no purchasing values will require to go hungry until they reorganize their internal economies and industries by producing ar taking out of the ground the equivalent of currency to balance imports by exports.

"For an example of this theory one has only to study what has already been achieved by such a small country as Czecho-Slovakia where determination, energy, and level-headed administration by shrewd commercial brains have placed her and her credit in a position to-day which must be the envy of other nations with far greater national resources and opportunities. Such a policy is the only permanent and reliable method of stabilizing exchanges. Export credits and other schemes introduced for the establishment of trade on long-deferred credits are only lending encouragement to European countries to rush into debt for goods they cannot pay for.

"It may be said that this doctrine carries little encouragement towards a speedy revival of trade in Great Britain, which lives to a very large extent upon her exports. True, but the obvious reply is that in our present state of reduced circumstances we must not trade beyond our means and cannot afford, however driven, to give unlimited or hazardous credit. We shall retrieve our own prosperity more quickly and surely by concentrated development of trade within the Empire, adding such outside business as exhibits a fair commercial risk, rather than retard reconstruction on normal lines by the encouragement of trading with insolvent nations against phantom credits which contribute to extravagance, indolence, thriftlessness, and inefficiency.

"America has recovered from the general depression to a greater degree than any other nation because about 80 per cent of her trade is within her own boundaries, because she has nursed and protected her industries, and consequently acts as a potent stimulant to production and employment.

"Prior to the war Great Britain was increasingly living as merchants for the distribution of the products of other nations. The aftermath of war has enormously extended capacity in almost every class of manufacturing equipment, and past conditions have been completely altered by similar extensions in other countries. In the peace-time war for commercial supremacy there will be no room for middlemen. Let us make certain that we do not drift into a position of being neither producers nor merchants.

A Gradual, not Spasmodic, Recovery

"Best interests will be served by a trade recovery that is gradual and not spasmodic. The interregnum of restricted trade should be utilized to the fullest extent in perfecting plant, processes, and production efficiencies for all classes of manufactures for which the country is advantageously placed. Chemicals and dyestuffs with unlimited sources of coal and coal-tar products, limestone, salt, etc., should form two of the most extensive. When reconstruction and re-establishment of confidence bring demand we should then be in a position to command a fair share of the world's trade against any fair competition.

"I cannot close without drawing attention to two fundamental services which go to the very root of cheap production, viz., cheap coal and cheap transport.

"Coal is a national asset, and consumers have a right to demand that home requirements will be served first,

and, further, that industrial demands at least will have supplies at minimum prices and never higher at the pit mouth than those prices which are accepted in the same position for export.

"Railway rates, coastwise traffic rates, and overseas freights are still in excess of what they should be, and unless they are materially reduced will certainly operate very adversely against British industrial development.

"Consultation between manufacturers and close co-operation between employers and employed should be encouraged to the utmost, with the object of obtaining maximum output, from a minimum plant, at minimum cost, and also that we may compete for world trade more collectively as a nation and less as isolated members, with no common interests."

German Dye Offerings Fail to Influence Italian Dye Markets, Well Supplied Under Government Regulation

Shares in Domestic Dye Works Rise Slightly on Enforcement of Import Regulations—False Rumors of Bank Troubles Check Upward Trend in Italian Exchange Values—Demand for Colors Remains Limited Owing to General Money Tightness

By RAFFAELE SANSONE

Genoa, January 7, 1922.
Special to The Reporter

THE low quotations on dyestuffs offered by Germany wrought little or no change in the prices prevailing in the Italian market during the past month, owing to the abundant stocks still available, to the production of still more dyestuffs by the domestic works, and to the colors imported from Germany under the Reparations Clause of the Peace Treaty. The demand, however, remained very limited because of the great scarcity of money, which reduced the buying capacity of the Italian consumers and caused them to practise unwonted economies in all articles of clothing.

Many were led to anticipate a sudden rise in Italian exchange values on the strength of a slight rally during the month which brought the United States dollar from a value of 24.50 lire to 21.70 lire, and the English pound from a value of 98.30 to 90.30 lire. They were doomed to disappointment, however, for the rise turned out to be no more than a flurry and had been caused by a momentary suspension of importations. When the latter were resumed and a near panic was created by rumors of an impending general financial crisis in all Italian banks—which proved to be groundless!—all foreign exchange values regained the lost ground and established themselves at former levels.

Because of a continued strict enforcement of the

TABLE I

	December 31 (lire)	December 1 (dollars)	December 15 (dollars)	December 31 (dollars)
Naphthol Yellow	50,000— 70,000	2,040—2,857	2,304—3,226	2,083—2,916
Auramine	70,000— 80,000	2,857—3,265	3,226—3,226	2,916—3,333
Orange II	30,000— 35,000	1,224—1,428	1,382—1,613	1,250—1,458
Nigrosine, water soluble	30,000— 40,000	1,224—1,632	1,382—1,843	1,250—1,666
Nigrosine, soluble in spirit	35,000— 40,000	1,428—1,632	1,613—1,843	1,458—1,666
Sulphur Black	7,000— 10,000	285— 408	322— 460	291— 416
Acid Black	35,000— 40,000	1,428—1,632	1,613—1,843	1,458—1,666
Direct Black	35,000— 40,000	1,428—1,632	1,613—1,843	1,458—1,666
Chrome Black	40,000— 45,000	1,632—1,826	1,843—2,073	1,666—1,875
Methylene Blue	80,000—100,000	3,265—4,080	3,686—4,608	3,333—4,166
Direct Blue	25,000— 30,000	1,020—1,224	1,152—1,382	1,041—1,250
Sulphur Blue	45,000— 50,000	1,836—2,040	2,073—2,304	1,875—2,083
Malachite Green	80,000—100,000	3,265—4,080	3,686—4,608	3,333—4,166
Acid Green	60,000— 70,000	2,448—2,857	2,765—3,226	2,500—2,916
Direct Green	50,000— 70,000	2,040—2,857	2,304—3,226	2,083—2,916
Bismarck Brown	40,000— 50,000	1,632—2,040	1,843—2,304	1,666—2,083
Magenta (fuchsine) Crystals	70,000— 80,000	2,857—3,265	3,226—3,686	2,916—3,333
Ponceaux	35,000— 45,000	1,428—1,836	1,613—2,073	1,458—1,875
Methyl Violet	70,000— 80,000	2,857—3,265	3,226—3,686	2,916—3,333

TABLE II

	December 1		January 5	
	(lire)	(dollars)	(lire)	(dollars)
Acetate af alumina	1,600	65	1,600	66
Chrome alum	3,000	122	3,000	125
Bichromate of potash	6,000	244	6,000	250
Ferrous sulphate	500	20	500	21
Copper sulphate	2,450	100	2,450	102
Tartar emetic	12,000	489	12,000	500
Aniline oil	15,000	612	15,000	625
White refined glycerine	9,000	366	9,500	400
Glucose, 45 deg Be	3,900	159	4,200	175
Hydrogen peroxide	2,100	85	2,100	87
Tannic acid, 60 per cent	20,000	816	20,000	833
Tartaric acid, crystals	10,750	438	10,750	443
Acetic acid, 30 per cent	2,500	102	2,500	104
Hydrochloric acid, 20-21 deg. Be	320	13	320	13
Formic acid	11,000	450	11,000	458
Lactic acid, 80 per cent	4,000	163	4,000	166
Alum	1,100	14	1,100	45
Ammonia, 22 deg. Be	1,550	63	1,550	64
Bisulphite of soda, 32 deg. Be	400	16	500	21
Chlorate of potash	3,600	146	3,400	141
Chloride of ammonia	4,500	183	5,000	208

dye import prohibitions by the Government, and the resulting broadening of the domestic sales field, the Italian dye plants were able to improve their position, and their shares rose slightly in value.

Imports and Exports of Colored Goods

The difficult moments through which Italy passed during 1921 caused the exportations of colored goods of all sorts to rise much above the importations, as can be seen from the figures given below, which relate to the first six months of that year. From them an idea of the initiative of the different Italian dye and print works can also be gathered.

	Imports (tons)	Exports (tons)
Colored hemp fabrics	6	10
Printed hemp and linen fabrics	2	5
Dyed cotton yarns	18	879
Dyed cotton cloth	302	12,052
Printed cotton cloth	349	1,463
Dyed loose wools	442	....
Dyed woolen yarns	4	26
Dyed woolen cloth	712	2,171
Printed woolen cloth	9	37
Dyed thrown silk	33	25
Dyed waste silk yarns	9	250
Dyed artificial silk	5	16
Dyed silk fabrics	40	321
Dyed half-silk fabrics	7	252

Prices of Coal-Tar Dyes

The quotations in Table I per ton in lire and dollars show the difference brought about by the United States exchange prevailing at the beginning of December, towards its middle and at its end.

Mordants, Assistants, Dyehouse Products

Although the demand for such products was strongly reduced during December, owing to the feasts and to the end of the year, very few prices fell, there being a marked tendency towards the rise of others. Some of the changes in lire and dollars per ton are indicated in Table II.

REPORTED REMEDY AGAINST DAMAGE DONE BY MOTHS IN WOOL TEXTILES

By U. S. Consul Wallace J. Young
Bradford, England

The monthly journal of the Chamber of Commerce of Huddersfield, England, for August quotes the following article on the above subject from the "Borsen Courier" of June 8, 1921:

"Under the name of 'Eulan' a new production of the German chemical industry has been placed on the market, for the explanation of which Dr. Meckbach delivered a scientific lecture, illustrated by film, in Berlin.

"After six years' work, founded on careful study, the dye works, formerly Friedrich Bayer & Co., Leverkusen, near Cologne, succeeded in discovering a process for the manufacture of mothproof wool. Great interest is shown in scientific and industrial circles in this invention, as it denotes a final victory over the clothes moth. The lecturer described the entire preparatory work that led to the invention. It was neces-

sary, in the first place, to study closely the zoology of the moth, especially three of the species, of which the clothes moth is the most dangerous, while the fur and wall-paper moth takes a second and third place.

"It was formerly asserted that wool interspersed with green dye was not eaten by moths. The experiment in Leverkusen contradicted this; it was discovered, on the contrary, that moths avoided a certain yellow dye known in chemical science as 'Martius Yellow.' But the question is not merely that of producing dyestuffs injurious to moths, as through the introduction of really poisonous dyestuffs the wool would be deprived of its entire beauty, and possibly be harmful to the wearer from a hygienic point of view.

"However high this new invention may be valued, some time will elapse before the general public can derive practical benefit from it. Immense quantities of wool, without any claim to being mothproof, lie in Germany, and how much care is expended on its preservation in the house and family! It will be well, therefore, not to entertain a too optimistic view regarding the future of 'Eulan,' but continue to wage war against the moth in the old approved manner."

BRADFORD WEBSTER ADJUDGED INSANE

Former Head of Dye Exchange Corp. Believed Himself Sought in Connection with Wall St. Explosion

Following his arrest on a charge of sending threatening letters to Chief William J. Burns, of the U. S. Department of Justice, Bradford Webster, once well-known New York lawyer and former dyestuff agent, was last week adjudged insane by Dr. M. S. Gregory, head of the psychopathic ward at Bellevue Hospital. The psychatrist reported his findings to Maxwell S. Mattuck, Assistant United States Attorney, who has been investigating the charges against Mr. Webster. The letters were said to be the result of a hallucination that Chief Burns was hounding the latter in an endeavor to obtain from him information concerning the Wall Street bomb explosion. Dr. Gregory gave as his opinion that Mr. Webster should not be at large, and found him suffering from "innumerable delusions, mostly of a persecutory nature, and all of which are unsound, foolish and of a fantastic nature."

Mr. Mattuck went before Judge John C. Knox, of the United States District Court, and suggested that on the strength of this report the charges against Mr. Webster be dropped. Judge Knox ordered that this be done with the understanding that Mr. Webster be turned over to the State authorities and placed by them in some asylum for the demented.

Mr. Webster came to New York some years ago from Waterbury, Conn., and developed a wide law practice. For some time he conducted the Dye Exchange Corporation, and in this way become known in the industry. Expressions of regret at his reported infirmity have been offered by numerous friends and acquaintances of Mr. Webster, and to these The Reporter herewith adds its own, accompanied by a sincere wish for his recovery.

DYES DISTRIBUTING CORP. REPRESENTING CINCINNATI, CIBA, GEIGY AND SANDOZ IN WEST

Announcement has been made by the Dyes Distributing Corporation, 227-223 West Huron Street, Chicago, Ill., to the effect that since January 1 this firm, by appointment, has been selling agent for the Western territory of the Cincinnati Chemical Works, Inc.; the Ciba Company, Inc.; the Geigy Company, Inc., and the Sandoz Chemical Works, Inc.

The corporation states that it is in a position to offer the large and complete lines of domestic and imported dyestuffs and chemicals of these companies from stocks carried in Chicago, Ill.; Cincinnati, Ohio; Portland, Ore.; San Francisco, Cal., and Los Angeles, Cal. Numerous well equipped laboratories enable consumers to obtain prompt and efficient service. J. B. Jones is president of the firm.

JOHN CAMPBELL & CO. PRODUCING PAPER YELLOW NFA ON LARGE SCALE

John Campbell & Co., 15 Hudson Street, New York City, have sent out to the trade dyed samples of paper stock illustrating the use of this company's Paper Yellow NFA. The sample in question was prepared—on a basis of 1,000 pounds of dry stock—with ten pounds of Paper Yellow NFA, seventy-five pounds of salt, and twenty-five pounds of soda ash. The ingredients were heated to 140 deg. and run in the beater for thirty minutes.

The company announces that it is manufacturing Paper Yellow NFA on a large scale and is, therefore, in a position to furnish excellent quality at an attractive price. This color can be used for delicate tints, including buff, amber, golden rod, etc., and product samples, price and other information may be obtained by addressing the company's office.

REPARATIONS COMMISSION ASKS U. S. STATE DEPT. TO DECIDE ON UNOFFICIAL AGENTS FOR AMERICA'S DYE SHARE

The Allied Reparations Commission has decided, according to an Associated Press dispatch, to cable to the American Government, through Roland W. Boyden, American unofficial representative on the Commission, to determine whether the Textile Alliance or the so-called minority dye interests are to be recognized by the Commission as the unofficial American medium for the delivery of the American shares of German dyes.

The Alliance, which for several years has been the unofficial American agent, ceased to continue in that capacity after last December 14, following a decision by the Department of State.

The American dye interests outside of the Alliance, and especially agents of the dye interests, have been making a fight before the Commission to obtain a portion of the American allotment of German dyes, which amounts to nearly $2,000,000 annually.

MEN OF MARK
in the
DYESTUFF FIELD

PERCIVAL J. WOOD

Vice-President and General Manager

Oriental Silk Printing Co.

Haledon, N. J.

PERCIVAL J. WOOD was born June 21, 1880, in Leeds, England, and received his preliminary education at the Leeds Boys' Modern School, entering in 1888 and leaving in 1895 to enter the University of Leeds. Here he took the full course in Dyeing and Tinctorial Chemistry, and on graduating in 1898 began his apprenticeship with William Grandage & Co., the Brownroyd Dyeworks, Bradford, which is now a branch of the Bradford Dyers' Association.

In 1901 he became Assistant Lecturer and Demonstrator of Practical Dyeing at the University of Leeds, in which post he spent the next two years, leaving in 1903 to come to this country, where he accepted the position of Chief Chemist to the American Silk Dyeing & Finishing Company, Hawthorne, N. J. In 1906 he transferred his activities to the Peerless Finishing Company, Nyack, N. Y., of which he was Assistant Superintendent until 1908.

It was in the latter year that he formed his connection with the Oriental Silk Printing Company, assuming the position of Superintendent and Colorist in the works at Paterson, N. J. Three years later, in 1911, he was offered the dual responsibilities of Treasurer and General Manager, and in 1913 he assumed the duties of Vice President and General Manager, which positions he occupies to-day.

S. O. C. M. ASSN. FINDS RETAIL MERCHANTS WILLING TO ELIMINATE MISLEADING DYE LABELS

May Co-operate with Laundry Owners to Bring About Further Clearing Up of Public Opinion

The regular monthly meeting of the Dyestuffs Section of the Synthetic Organic Chemical Manufacturers' Association was held January 20 in the rooms of the Association, 1 Madison Avenue, New York City. Very satisfactory reports were received concerning the elimination by retail merchants of labels on dyed materials bearing statements calculated to throw doubt into the minds of customers regarding the reliability of American dyes.

In connection with this general subject, an interesting discussion was held on the details of a proposed co-operative work with the National Laundry Owners' Association whereby it is believed that a further clearing up of public opinion concerning American dyes will result. This movement is somewhat along the lines now being so successfully followed by the National Council on Colors and Dyes, which organization has already done effective work in clearing up certain disputed points, and in proving that American dyes are now available to meet the most drastic requirements of the consuming trade.

A report was made of active progress by the committee appointed at the last general meeting of the association on the definition of the term "synthetic organic chemical," this definition having unusual importance because of its bearing on the membership of the association and also on the administration of Title V of the emergency tariff act. The report of this committee will be forwarded to the proper officials of the Treasury Department.

The members of the section reported receipt of the questionnaires from the Tariff Commission for the forthcoming census for 1921. The manufacturers are now engaged in compiling this information for prompt return to the Tariff Commission.

The general consensus of opinion of those present indicated that while business conditions are fairly active in certain lines, nevertheless the industry must wait upon the enactment of definite tariff legislation before attempting an intensified development policy.

[Note—Seizing the opportunity provided by the above account to respond to the many inquiries recently directed at this office concerning the present status of the American Dyes Institute, it may be said that the latter organization has been preserved intact and is functioning as heretofore, and that many members of one body are also members of the other.—Ed.]

At the annual meeting of the stockholders of the Monsanto Chemical Works, St. Louis, Mo., held at the main office January 16, the following directors were elected: John F. Queeny, Gaston Du Bois, Theodore properties, and is valuable for dyeing in combination John R. Goodall. At the annual directors' meeting, held on the same date, the following officers were elected to serve during the ensuing year: Chairman of the board, John F. Queeny; president, Gaston Du Bois; vice-president, H. O. McDonough; treasurer, W. R. Phemister; secretary, Edgar M. Queeny; assistant secretary, C. A. Zacher.

NATIONAL QUINOLINE YELLOW AND NATIONAL WOOL GREEN S ARE PLACED ON MARKET

The National Aniline & Chemical Company announces placing on the market two new products, National Quinoline Yellow and National Wool Green S, product samples and dyeings from which will be furnished upon application to the company's main office, 21 Burling Slip, New York City, or any of its branches.

National Quinoline Yellow is the most recent addition to the line of acid dyes manufactured by the company, and is in all respects equal to the Quinoline or Chinoline Yellows that have been familiar to the dyestuff trade for many years. This product yields very bright, greenish shades of yellow on silk or wool. It is readily soluble, possesses excellent level dyeing properties, and is valuable for dyeing in combination as well as self-shades. It is not dischargeable with hydrosulphite, and therefore should be of especial interest to the printer making color discharges.

National Wool Green S should be of value to dyers of piece goods. It possesses excellent solubility, dyes level, and exhausts well from the dye bath. It possesses good fastness to perspiration and organic acids, as well as to washing, fulling and carbonizing. It is particularly serviceable for producing mode shades in combination with other level dyeing "National" acid dyes. For shading purposes it may be added with safety to the boiling dye baths. It is recommended for dyeing worsted and woolen dress goods and yarns, and for either wool or fur felt. The general utility of this new product is indicated by the fact that the dyer of silk may employ it on either weighted or unweighted silk. It is also extensively used for dyeing carpet yarns. After-treatment with bichromate somewhat improves its fastness to light and washing without materially altering the shades.

"G. E. T." NOW WITH BROOK WOOLEN CO., ONTARIO

Readers of The Reporter will probably be interested to learn that George E. Templeton, owner of the familiar "G. E. T." signature of the late "Dye-A-Grams" column, and occasional contributor of more serious matter in the form of technical articles, has severed all connection with the Brown Woolen Mills, with which he was formerly identified, to become superintendent of dyeing and finishing for the Brook Woolen Company, Ltd., Simcoe, Ontario.

This firm, which specializes on the manufacture of horse clothing, traveling rugs, bed blankets and mack-

inaws, but has of late added various woolen dress goods to its line, has recently completed a new concrete dye and finishing house, 150 x 130, equipped with James Hunter Machine Company type kettles. There is a complete and up-to-date laboratory, and Mr. Templeton reports the plant to be running full time, with occasional overtime, which is exceptional in view of present conditions in the textile industry of Canada. The REPORTER takes this opportunity of wishing him success in his new connection.

N. Y. ARCHITECTURAL LEAGUE EXHIBIT WILL SHOW USE OF AMERICAN DYES FOR INTERIOR DECORATION

The annual exhibition of the Architectural League of New York takes place this year in the Fine Arts Building, at 215 West Fifty-seventh Street, that city. The opening ceremonies will be held Friday, February 3, at 9 p. m., and the reception will take place Saturday, February 4, from 3 to 6 p. m.

There will be a public exhibition commencing on Sunday, February 5, and lasting until March 4, inclusive. Hours will be from 10 a. m. to 6 p. m. and from 8 p. m. to 10.30 p. m.; Sundays, from 1 p. m. to 6 p. m.

Admission will be 50 cents, except on Mondays, which is a free day.

The exhibit this year will include drawings and models of proposed and executed work, both in architecture and the allied arts; also, specimens of decorative painting, furniture, metal work and ceramics. A particular feature will be the application of American-made dyestuffs to interior decoration.

SCOTTISH WOOL DELEGATION UNIQUE IN BRITISH TRADE ANNALS

Two years ago, to counteract the mischief which was being done to the age-long traditional reputation of Scottish woolens by the flooding of the world's markets with cloth purporting to be Scotch tweed but for the most part neither made in Scotland nor consisting of pure virgin wool, but composed largely of shoddy, frequently adulterated with cotton, the Scottish woolen manufacturers applied to the British Government Board of Trade for a collective national trademark for the identification of genuine Scottish woolens. The Board of Trade granted the use of such a mark, guaranteeing the cloth upon which the mark is stamped as "Made in Scotland of Pure New Wool," at the same time laying down stringent regulations as to its use.

The Scottish manufacturers formed an association, "The Scottish Woollen Trade Mark Association," for the purpose of administering and giving publicity to the national trade-mark, and this organization, as will be remembered, decided to send a representative official delegation to the United States and Canada to investigate the North American market and to study the best methods of developing there the demand for genuine Scottish woolens. It is believed that this is the first occasion on which an official delegation has been sent from England overseas in the interests of a representative national industry.

The visiting delegation consists of about twenty members, representing about one-half of the entire output of Scottish woolens. Many of the members of the delegation bear names which have been identified for generations with the traditional tweed industry of the Scottish border.

The delegation sailed from Liverpool for New York on December 31. It has visited New York, Washington, Philadelphia, Boston, Montreal, Toronto and Hamilton, and its subsequent itinerary will be as follows: Buffalo, January 31; Rochester, February 1, Cleveland, February 2, and Chicago, February 9.

NOTES OF THE TRADE

Under the laws of New York the Thompson Chemical Company has been incorporated with a capital of $1,000,000 to manufacture chemicals. The incorporator is the United States Corporation Company.

Herman A. Metz, head of the chemical and dyestuff house which bears his name, has been appointed by Governor Miller of New York as a member of the commission to revise the State charter.

The American Fabric Company, Providence, R. I., formerly at 690 North Main Street, has been incorporated and removed to 289 Thurber's Avenue. Jacob Kermer is president.

The Improved Shuttle Company, 10 Arlington Street, Paterson, N. J., has been formed to manufacture a safety lock shuttle for use on ribbon looms. The device prevents the quill spindle from jumping out of the shuttle, thereby preventing smashes from this cause. The members of the company are Gottlieb B. Wilms, of Paterson, and John H. Steiger, of Allentown, Pa.

The Harkins-Hammack-Whitlock Company, Hendersonville, N. C., has ordered architects to prepare plans and specifications for the erection of a building to be equipped for manufacturing hosiery.

The Corona Chemical Company, 16 East Fortieth Street, New York, has filed notice of increase in capital from $25,000 to $500,000.

H. Carroll Brook, secretary and treasurer of the Edgewater Dyeing & Finishing Company, Philadelphia, Pa., has been elected president of the Board of Commissioners of Cheltenham Township.

The Calexico Cotton Products, Inc., Calexico, Cal., has been incorporated to deal in and manufacture cotton and textiles. Capital, $50,000; shares, 500 at $100 each, of which $30,000 has already been subscribed.

INQUIRY DEPARTMENT

All classes of chemical work or advice relating to artificial colors, natural dyestuffs, dyewoods, raw materials, extracts, intermediates, crudes, or dyeing chemicals and accessories in general, will be carried out for readers and subscribers of the AMERICAN DYESTUFF REPORTER by this department.

Inquiries of a minor character will be answered on this page, while major matters involving personal investigation, analyses, perfected processes and working formulas, will, if desired, be treated confidentially through the mails. In answering inquiries which, by their nature, require reference to the products, processes or apparatus of some particular manufacturer we aim to be absolutely impartial. We refer the inquiries to specialists whom we believe to be best qualified to answer them intelligently, and must disclaim responsibility if their reports show unintentional bias. All questions, materials for analysis or letters leading to the opening of negotiations for special work will receive prompt attention if addressed to Inquiry Department, American Dyestuff Reporter, Woolworth Building, New York City.

S. D. M. Co.—*Question:* We have tried many recipes for sizing coarse twines of hemp, jute, etc., but all lack luster. What particular materials are commonly used in these mixtures to produce the luster? What part do friction and heat play?

Answer: A common and satisfactory size is made up as follows: Corn starch, 60 pounds; sulphate of alum, 2½ pounds; formaldehyde, 1 pint; water to total 60 gallons.

The ingredients are mixed cold into a milk. This is then brought to a boil with live steam (fifteen minutes) and cooked fifteen minutes longer to give a uniform mixture. It should be agitated while cooking.

It is often found advantageous to use Japan wax, tapioca and soluble oils in conjunction with the above formula, depending on the twine. A rough, hairy twine requires a size that will lay the hair. Tapioca helps in this respect. The wax and oil varies the degree of softness of the twine.

The heat required depends on the surface contact the twine makes with the drying cylinder. Generally 150 deg. Fahr. is the temperature of the drying cylinder. The twine should not be taken off too dry, as a brittle twine results. Friction plays a very important part in the polishing of twines. A too heavy pressure will scrub the twine and ruin the finish, especially if the twine has become dry before leaving the machine. A brisk, gentle rubbing gives the best results, while the heat should be so regulated that the twine is barely dry when leaving the machine.

A very good twine and a very poor twine may be produced with the same size, depending upon conditions in the polishing machine. If properly handled on the machine, the above size should give a very satisfactory and durable luster.

H. S. Co.—*Question:* We are occasionally called upon to redye faded woolen garments. In many instances the results are most unsatisfactory in that the faded portions come out quite a different shade from the unfaded portions. Can you give us any suggestions?

Answer: There are two methods which we believe will overcome your difficulty.

The first is to bleach the material, prior to dyeing, in a bleach bath made in the following manner: Two per cent of soluble oil is weighed off into a pail, 1 per cent of sodium peroxide is then added, and this is then added to the bath in which the material has been wet out. The temperature should be lukewarm and gradually increased to a boil; boiling is then continued for about thirty to forty-five minutes. This will usually bleach the material sufficiently so that it is entirely level. The dyeing can then be accomplished.

The second method is to give the material a light chroming. About 2 per cent of chrome and 3 per cent of acetic acid is used; the material is boiled forty-five minutes to one hour, and then dyed. The percentage is figured on the weight of the material.

In order to get the best results it is usually necessary to redye in heavy shades only. Unless the material has been very badly faded, either of the methods above will generally be found satisfactory, although in some cases the prolonged action of sunlight will be found to have affected the chemical structure of the wool fibers so that no treatment will entirely restore their natural affinity for the dye.

L. P. J.—*Question:* Is there any way that hydrosulphites can be used for cleaning the hands when stained by dyes?

Answer: As all the hydrosulphites are only effective at temperatures near boiling, it has so far not been possible to utilize them for such a purpose. Chloride of lime and soda remain the best things we know of.

R. B. N.—*Question:* I am using an after-chromed black on wool shoddy, dyed in an open kettle. The laboratory dyeings are of good shade and fast, but the practical work always comes out reddish and will not stand fulling. How can I correct this?

Answer: In your laboratory dyeing you probably are able to dye the material evenly and chrome it uniformly, so that all the black is changed into the dark and fast color, as it should be. When you work in an open kettle, poled by hand, it is not so easy to get the chrome distributed before it has acted on the black. The result is that some portions are overchromed and become rusty, while other parts, not being acted on by the chrome, still retain the red shade of the unchromed black. If you cannot install a stock-dyeing machine for this work you will have to take more time and add the chrome over a longer period of time while poling, so as to distribute it more evenly.

Review of Recent Literature

Cotton Facts; 1921 Editon, flexible binding. New York, Shepperson Publishing Company, Inc.

This book covers thoroughly every branch of the business, from the production and marketing of cotton to its manufacture and distribution. It gives the latest figures from official and other reliable sources concerning the acreage and yield of cotton, its condition during various periods of its growth, the surrounding climatic conditions affecting its growth at different points in its maturity, and the date of harvesting, all covering a series of years; facts and figures concerning the world's movement of cotton, exports, imports, amounts of sales, values, market fluctuations, prices, distribution and consumption, covering in detail a series of years, making the work invaluable to merchants, brokers and shippers interested in market statistics. It has been thoroughly revised and enlarged in many important particulars, viz.: Comparative statistics on killing frosts, seasons 1919-20 with 1920-21; the extension of statistics on ginning to specified dates to cover a period of ten years back; exports from Egypt; world's invisible supply, carry-over, supply at close of season, weekly sales at Liverpool, Japanese consumption; consumption by world's spindles; exports of cloth and yarns from United States; Japanese yarn exports; extension of table on sales of print cloth; trade in foreign countries (manufactures); cottonseed exports; with additional material on the products of cotton and cottonseed oil meal.

Thin Boiling Starches. George E. Chamberlain; "Cotton," January, 1922; p. 172.

Author declares that one of the important steps forward in the manufacture of cotton fabrics has been the introduction of properly prepared thin boiling starches, and cites the difficulties in securing these in days gone by. He states that under modern methods these difficulties have been eliminated and a thin boiling starch is now produced which is entirely satisfactory. A description of the manufacture follows, which is succeeded in turn by a discussion of application methods for securing the best results, one of which is a great reduction in attrition on the warp. This is a common source of loss when ordinary pearl starch is used, because of the latter's failure to penetrate and thoroughly saturate the yarn. When the fibers which constitute a strand of yarn do not adhere closely together, they protrude and are broken off, but by the use of thin boiling starch the fibers are cemented more closely together, and tests by actual weight have, it is declared, demonstrated an average decrease in shedding.

The writer also finds that because of the ability of a thin boiling starch to bind the fibers together into one compact body, the strength of the yarn is very materially increased. Tests have shown this increase to be from 12 to 15 per cent.

Under normal conditions, the greater the strength, and the greater the elasticity, the smaller the number of breaks, and breaks make seconds; so that an increase of strength in the warp of 12 to 15 per cent makes quite a remarkable decrease in the amount of seconds produced by the loom.

Looked at in another way, the use of thin boiling starch in the slasher box will make a short fibered cotton as strong as those spun from longer fiber. Also, because of its penetration, it does not dry with a hard, brittle crust on the surface of the yarn, as does ordinary pearl starch, but instead dries into a flexible finish which gives a "soft, pleasant" feel to the finished goods. These numerous advantages are particularly apparent in the manufacture of print and similar goods, and in heavier weaves the advantages persist but to a lesser degree.

Author concludes that by using well-made thin boiling starches: First, one decreases shedding 50 per cent; second, increases the strength of the yarn 12 to 15 per cent; third, decreases breakage 50 to 75 per cent; fourth, decreases production of seconds in proportion; fifth, gives a soft, agreeable finish to the goods.

Dress, Blouse and Costume Cloths. Roberts Beaumont and Walter George Hill. London.

The treatment of textile manufacture from the standpoint of the commercial uses of the fabrics is of real value, and this discussion of the design and manufacture of dress, blouse and costume cloths is a most comprehensive one. The authors have attempted to interpret the commercial and industrial aspects of the trade; the nature, structure and qualities of the yarns employed; the weaving principles involved; the design and color schemes elaborated, and the systems of fabric construction and manufacture practised. Technical and working data are supplied on the manufacture of each standard class of dress fabric in cotton, silk, wool, linen, canvas, etc., and of the many varieties of fancy fabrics.

After a general discussion analyzing the industrial range, the following subjects are discussed in the succeeding chapters: The Yarn Unit; Silk—Thrown, Spun and Artificial; The Yarn Unit Applied; Weave Elements and Cloth Construction; Drafted Patterns—Stripes; Geometric Design Bases—Weave Compounds; Spotted and Mosaic Patterns; Practice in Figure Designing; Pile, Pappet and Gauze Structures.

The utility and function of color in the various classes of dress fabrics are illustrated and defined.

Announcement has been made by the Prospect Dye Works, Brooklyn, N. Y., to the effect that the capital of this firm has been increased from $12,000 to $30,000.

Recent Patents

Production of Cellulose from Vegetable Matter

(1,402,210; January 3, 1922)

Gonzalo Jose Bustamonte

This describes the process of obtaining cellulose from vegetable matter, which consists in immersing the vegetable matter to be treated in cold water; separating it into coarse fibers; depositing the fibers in a receptacle containing anhydrous lime; successively supplying a cold alkaline solution and a solution of volatile alkali to said receptacle; successively acidulating the bath thus formed with hydrochloric and sulphuric acids; thereafter washing the fibers with cold water; and finally comminuting said fibers.

Treatment of Cellulose or Materials Containing Cellulose

(1,402,201; January 3, 1922)

Matthew Atkinson Adam

Claim is granted, in a process of treating woody matter in a finely subdivided form, the steps which consist in forming thereof a fluent pulp with an added chemical solution, and then subjecting the said pulp in a continuous stream of digestion under heat and pressure.

Chromium Compounds of Azo Dyestuffs

(1,402,350; January 3, 1922)

Joseph Grimmer and Fritz Straub (assignors to Society of Chemical Industry in Basle, Basle, Switzerland)

Patentee describes new chromium compounds resulting from the treatment of the new mordant dyeing dyestuff of the general formula R — N = N — R′ (wherein R — N = N — signifies a 1-diazo-2-oxynaphthalene-4-sulphonic compound and R′ a halogenated alphanaphthol) with an agent yielding chromium, which constitute dark powders soluble in water with blue to greenish-black and in concentrated sulphuric acid with greenish-blue to violet colorations and dye wool, when dyed according to the manner usually employed for acid dyestuffs, very equal and very fast blue to gray tints.

Method of Coating Fabric with Vulcanizable Plastic Material

(1,402,288; January 3, 1922)

George F. Fisher (assignor to Revere Rubber Company, Providence, R. I.)

This is a continuous method of skim-coating both sides of fabric with relatively stiff and non-spreadable plastic which consists in continuously forming the plastic into continuous and unbroken films of the desired uniform thickness, and immediately feeding the films while free and unconfined to opposite sides of the fabric, and continuously and simultaneously pressing the films onto the fabric at directly opposite points.

Color Composition, and Process of Preparing Same

(1,402,442; January 3, 1922)

John Jermain Porter

This is a changeable color composition comprising a deliquescent color compound combined with a sufficient quantity of a dry absorptive diluent to hold the hygroscopic moisture absorbed by the color compound.

Fabric Stripping Machine

(1,402,067; January 3, 1922)

Cassell D. Hibbs

Description is given of a fabric stripping machine comprising a reel adaptable for holding tire casings of different diameters, a stripping shaft, means for positioning said shaft closer to or farther from said reel and means for driving said stripping shaft.

Drying and Shaping Structure for Drying Lace Hosiery

(1,402,532; January 3, 1922)

Thomas F. O'Connell (assignor to Paramount Hosiery Form Drying Company, Chicago)

Patentee describes a hosiery drying and shaping form relatively thin in cross-section and having arc-shaped, fabric-flattening front and rear faces, the width dimensions of which vary intermediate the ends of the form, and having, also, oppositely-disposed crease-producing side edges, and including an elongated leg portion, a foot portion extending in longitudinal alinement therewith, and an integral heel section between the leg and foot portions and outstanding from the rear face thereof at the lower end of and as a continuation of the foot portion.

Process of Bleaching Cotton

(1,402,040; January 3, 1922)

Harry P. Bassett

This is a process of bleaching cotton fibers which comprises hydrolyzing the typical gums and resins present in the fibers with an acid solution of not in excess of substantially 1½ per cent strength to form soluble sugars and organic acids, washing to remove the sugars and the soluble organic acids, treating with an alkaline solution of not in excess of substantially 2½ per cent strength to form salts of the organic acids, washing to remove the salts formed, and bleaching.

Knitting Machine

(1,402,038; January 3, 1922)

George L. Ballard (assignor to Wildman Manufacturing Company, Norristown, Pa.)

Claim is granted, in a knitting machine having spring beard needles, for a cylinder, a ring having a ledge and a rib overhanging the same and pressers individual to the

needles pivotally supported at their lower ends on the ledge and having movement at their upper ends to and from the needle beards, said pressers at their lower portions bearing upon the needle shanks and having shoulders engaging under the rib to be held in place thereby, said pressers being adapted to be removed by first removing the needles, thereby providing space to permit the displacement of the shoulders of the pressers from under the rib of the ring.

Slicing Mechanism for Circular Knitting Machine

(1,402,394; January 3, 1922)

George P. Bosworth and Eugene M. Gunning (assignors by mesne assignment to Hemphill Company, Central Falls, R. I.)

This consists, in combination, in a circular stocking knitting machine, with a main yarn feed finger, means for splicing an area less than the full circumference of the stocking, comprising a circle of needles, one-half of which are long butt instep needles and the other half of which are short butt heel and toe needles, all the long butt needles occupying one side of the needle circle and the short butt needles occupying the other side of the needl circle, a splicing yarn finger movable to and from feeding position, needle cams, and a central guard cam, the said central guard cam having cam surfaces for the short and long butt needles respectively for dividing the half-circle of long butt needles from the opposite half-circle of short butt needles to permit feeding the splicing yarn to the short butt needles only, which also take the main yarn, the said movable splicing yarn finger remaining in feeding position during round knitting and throughout the needle circle while the spliced area is being formed and thereafter being withdrawn, substantially as described.

Thread Carrier Stop Mechanism for Circular Knitting Machines

(1,402,033; January 3, 1922)

Melchior Zwicky (assignor to Textile Machine Works, Wyomissing, Pa.)

Description is given, in a full-fashioned knitting machine having thread-carrier rods and a narrowing screw; a stop-nut on said screw carrying a plurality of selectively usable stops for one rod each arranged to be moved into and out of end-abutting position.

Tucking and Drop Stitch Mechanism for Knitting Machines

(1,402,379; January 3, 1922)

Frank W. Robinson (assignor to the Nolde & Horst Company, Reading, Pa.)

Patentee describes, in a knitting machine comprising needles having butts of different lengths and certain of the long and short butt needles provided with relatively long latcher; main latch clearing cams adjustable to clear all of the needles or the short-latch needles only, and supplemental latch clearing cams effectively operative upon the shorter butt needles only.

Coking Retort Oven

(1,402,272; January 3, 1922)

Joseph Van Ackeren (assignor to the Koppers Company, Pittsburgh, Pa.)

This consists, in a coking retort oven, in combination; a plurality of coking chambers; heating walls contiguous to said coking chambers and respectively constituted of a series of combustion flues; regenerators located in planes below the planes of the coking chambers and the heating walls, said regenerators respectively having their checkerwork divided into a plurality of compartments, each one of which communicates individually with a group of combustion flues of a heating wall, and having a tunneled passageway interconnecting all the compartments of a like degree of remoteness, with respect to the side of the battery, of a plurality of regenerators; and means for separately controlling the flow in the interconnected series of compartments of a plurality of regenerators; substantially as specified.

Regenerative Coke Oven

(1,402,770; January 10, 1922)

John E. Hubbell (assignor by direct and mesne assignments of one-third to Louis Wilputte and two-thirds to Alice A. Wilputte, New Rochelle, N. Y.)

This consists of a coke oven having a series of horizontal coking chambers and a series of heating walls alternating with the coking chambers and each formed with a plurality of vertical heating flues connected at their upper ends and supporting walls beneath and parallel to the heating walls and walls transverse to the supporting walls dividing the space between each pair of supporting walls into a plurality of regenerating chambers separately connected to the lower ends of the flues in an adjacent heating wall and forming two sets, one at each side of a central flow reversal plane with the regenerators in each set all "on" or all "off" at the same time, the improvement which consists in separate conduit connections for groups of regenerators of each set located at different distances from said flow reversal plane, said conduit connections being parallel to and extending between said supporting walls.

Warp Dyeing Machine

(1,402,765; January 10, 1922)

Walter F. Haskell.

This machine and its operation was fully described by Mr. Haskell in an article in The Reporter of November 7, 1921, page 33, which see.